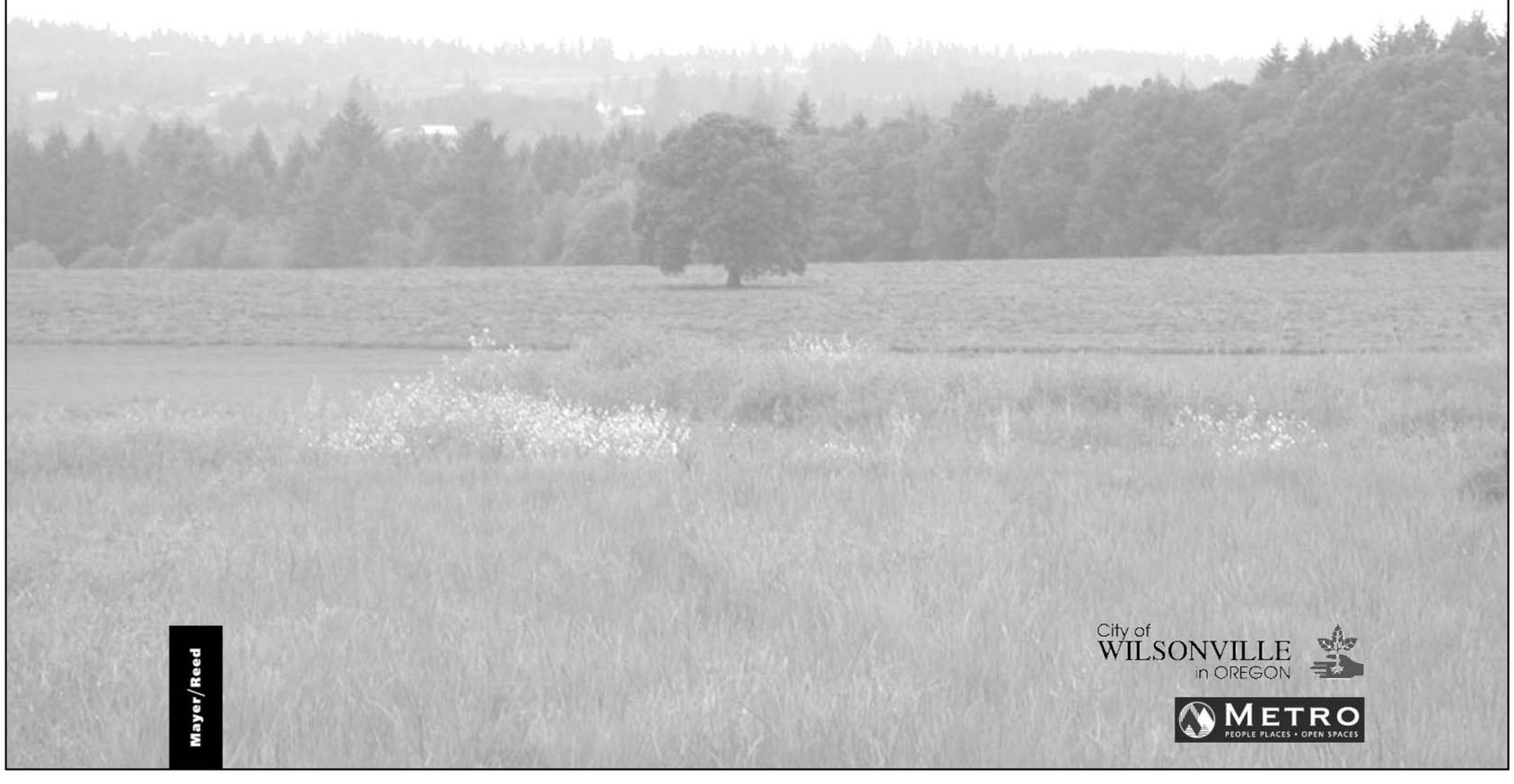
# Wilsonville Tract

Master Plan & Natural Resources Management Plan - March 2004



Mayer/Reed

City of WILSONVILLE in OREGON

METRO
PEOPLE PLACES • OPEN SPACES

# Wilsonville Tract

## Master Plan & Natural Resources Management Plan

January 2004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**City of Wilsonville** - adopted March 15, 2004

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# Executive Summary

# Executive Summary

The Wilsonville Tract Master Plan and Natural Resources Management Plan is a framework that will guide future site development and management. The overall intent of the master plan is to protect existing natural resources and enhance or recover ecological systems, while carefully balancing the desire for enjoyment by the public. The master plan is intended as a reference for public agencies and the community when making both short and long-term decisions for the implementation of improvements, enhancement and restoration of this 230-acre preserved open space.

The Wilsonville Tract was acquired by Metro as a part of the 1995 Open Spaces Bond Measure. The language of the bond measure states that such acquisitions are to be used to "... provide and protect open space and for passive recreational activities, including but not limited to, picnicking, hiking, bicycling, camping, bird watching and boating."

## Master Plan

The overall master plan concept is to protect and restore the site to a more natural ecological system that provides diverse native plant communities and wildlife habitat. Master planning goals established during the design process guided the project team in the preparation of the plan. These goals are as follow:

- Preserve the existing natural features of the Wilsonville Tract.
- Restore and enhance existing natural resources for ecological diversity.
- Plan for trail connections to the Wilsonville Tract.
- Protect natural areas while providing appropriate passive recreational opportunities, such as trails, on site.
- Provide a safe and convenient north-south pedestrian and bicycle connection through the property from the Villebois development to adjacent middle and elementary schools.
- Provide opportunities for interpretive information and educational programs in cooperation with the Center for Research on Environmental Science and Technology (CREST).

## Site Improvements

Through the public process it was acknowledged that usage of the Tract by the public is desirable, especially in conjunction with the CREST. However, site improvements and access must be limited with respect to sensitive areas and balanced with the natural resources of the site. It is intended that visitors will appreciate the purpose of the preserved open space, and that it is, in many ways, very different from a traditional community park. Recommended site improvements include the following:

- A heirarchy of trail types that access the diverse habitats on-site.
- Pedestrian and bike linkages to adjacent properties, regional open spaces and future linkage to the Willamette River.
- Limited vehicular access and parking.
- Picnic shelters at trailheads.
- Restroom facility near trailhead with parking.
- Interpretive signage.
- Creek bed and hydrological restoration in certain locations.
- Native re-vegetation and habitat restoration using appropriate native plant communities.

The Wilsonville Tract Master Plan is a model for environmental stewardship and planning of open space in balance with human activities and interests. Field investigations discovered that out-of-basin stormwater flows (since the 1950s) from the former Dammasch State Hospital site have caused extensive erosion and bank failures throughout Legacy Creek. The restoration of this stream channel has been recognized as the highest priority project.

## CREST

The efforts for preservation, restoration and improvement to the Tract represent a unique model of cooperative partnerships among Metro, the City of Wilsonville and the West Linn-Wilsonville School District. The school district funds and operates CREST, which is located southeast of the Tract. The adjacency to the Tract's diverse natural resources provides students at the CREST with a hands-on outdoor classroom. Volunteers and students of CREST will assist in the recommended restoration and monitoring activities of the Master Plan. The Tract will be a model for large-scale ecological recovery from creek restoration in steep forested ravines to the transformation of agricultural lands back to wetlands, prairie grasslands and oak savannah that were once present on the site. The CREST will act as the gateway to the Tract and will become a repository of research documentation and educational information of the Tract's restoration.

## Conclusion

Charlotte Lehan, Mayor of the City of Wilsonville stated, "With its blend of forest, uplands and wetlands, the property will be a valuable open space. I'm very pleased to see the habitat protected for wildlife and as a future place for people to study and enjoy nature close to home."

Partnerships of local and regional public agencies, schools and volunteer groups will be key to the success of the Wilsonville Tract as a nature preserve and open space. The Wilsonville Tract Master Plan and Natural Resources Management Plan together are documents that convey an understanding of goals and objectives and technical aspects of the site. Metro and the City of Wilsonville will explore opportunities for sources of funding for projects as well as ways to get groups and individuals involved in long-term stewardship of the property.

Future detailed planning, design and management of this regional resource will be required to carry out the full intent of this plan. The master plan is intended to be a concept or guide, rather than a mandate. As time passes, community values may change and site conditions will evolve, so modifications of this plan will be required. As such, a review of the plan's implementation should be done, followed by a review of the plan vision every three to five years.

# Introduction

Study Purpose

Location

Background of Acquisition

Mission Statement

Master Plan Goals

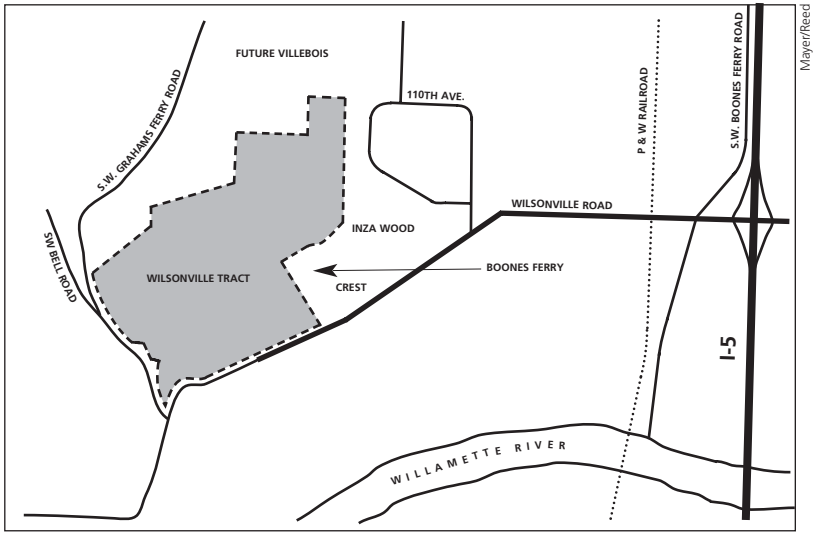
Master Plan Program Elements

Public Involvement

# Introduction

The 230-acre Wilsonville Tract property was acquired by Metro through funding provided by the $135.6 million Open Spaces, Parks and Streams Acquisition Greenspaces Bond Measure (Resolution No. 95-2074-A) in 1995. Since that time, approximately 8,000 acres of regionally significant open space properties, including 72 miles of river and stream frontage, have been acquired to protect natural resource areas, provide the public with passive recreational opportunities and help to link the urban environment to the natural environment. The Wilsonville Tract is a key parcel of the larger Tonquin Geological Area that forms a wildlife corridor from the Willamette River through the Wilsonville Tract to the Coffee Lake Creek basin. Metro has acquired a total of 487 acres in the Tonquin Geological Area.

The Metro bond measure funds are to be exclusively used on open space acquisitions in 14 regional target areas and six trail and greenway project areas. Currently, most of the acquired open space is land-banked. The open spaces are closed to the public until funding is available for master planning and development. Most of the open spaces are currently being maintained in a stable, but unimproved and undeveloped condition, though some are being managed by local park providers and are currently being made available for public use. Metro is now exploring financial opportunities regarding the future development and management of the newly acquired open spaces.



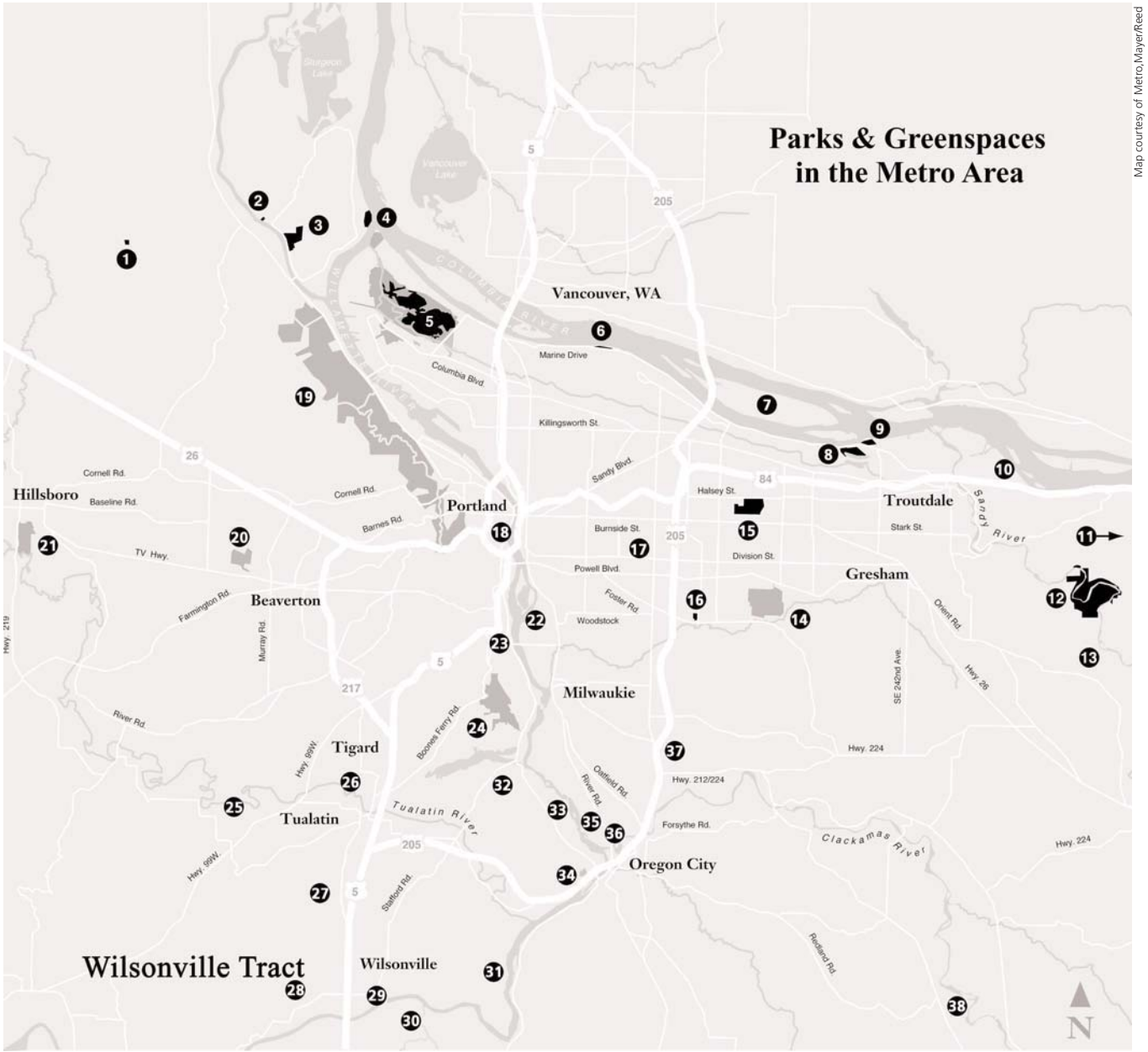
Context Map

The City of Wilsonville, in cooperation with Metro, Clackamas County and the West Linn-Wilsonville School District, directed the master planning process for the Wilsonville Tract. The City will partner with Metro on future protection and enhancement efforts. Metro, as owner of the property, has responsibility for the long-term management of the Wilsonville Tract.

## Study Purpose

The purpose of this study is to prepare a master plan that will serve as a guide to the future management and development of the Wilsonville Tract and comply with Metro requirements. This study will also be used as a tool by the City of Wilsonville and Metro to obtain funding for implementing the goals and objectives of the study.

The master plan was based on data that was gathered and analyzed on a range of topics including: historic and current natural resources, site opportunities and constraints, cultural significance, regional significance, and community needs.




Map courtesy of Metro,Mayer/Reed

## Parks & Greenspaces

1. Mason Hill Park
2. Sauvie Island Boat Ramp
3. Howell Territorial Park
4. Bell View Point
5. Smith & Bybee Lakes
6. M. James Gleason Boat Ramp
7. Government Island
8. Blue Lake Regional Park
9. Chinook Landing
10. Gary and Flagg Islands
11. Larch Mountain Corridor
12. Oxbow Regional Park
13. Indian John Island
14. Powell Butte Park
15. Glendoveer Golf Course
16. Beggars-tick Wildlife Refuge
17. Mt. Tabor Park
18. Waterfront Park
19. Forest Park
20. Tualatin Hills Nature Park
21. Jackson Bottom
22. Oaks Bottom Wildlife Refuge
23. Willamette Park
24. Tryon Creek State Park
25. Tualatin River National Wildlife Refuge
26. Cook Park
27. Coffee Lake
28. **Wilsonville Tract**
29. Memorial Park
30. Mollalla River State Park
31. Rock Island Landing
32. Lusher Farms
33. Mary S. Young State Park
34. Camassia Nature Reserve
35. Meldrum Bar Park
36. Clackamette Park
37. Mt. Talbert
38. Melver Park

## Location

The Wilsonville Tract is located in Clackamas County directly adjacent to the Urban Growth Boundary and city limits of the City of Wilsonville, Oregon. The site is 1 1/2 miles west of Interstate 5, immediately north of Wilsonville Road, and east of SW Bell Road and SW Grahams Ferry Road. The Tract is adjacent to the Boones Ferry Primary School, CREST, Inza Wood Middle School and the Park at Merryfield.

## Background of Site Acquisition

A grassroots organization called Friends of Goal Five (FOG5) in the late 1980's, grew out of a concern by Wilsonville residents for the preservation of open space and natural areas. The Friends group is comprised of citizens of the greater Wilsonville area, who are interested in the planning and development process as a means to ensure a balance between growth and the environment. Friends of Goal Five members seek to identify resources such as meadows, wetlands, and forests in the Wilsonville area, educate the public as to their relevance and importance, and assist in their protection.

Friends of Goal Five, along with Metro, advocated for the Division of State Lands (DSL) to acquire the Wilsonville Tract in early 1993. FOG5 was active in all of the Wilsonville Tract Management Plan meetings in 1994. Through that process it became evident that the state would not be able to preserve the land in perpetuity. DSL was more likely to sell at least part of the land and/or its resources, despite public sentiment to the contrary.

In 1995, citizens in the Portland metropolitan region approved the Open Spaces, Parks and Streams Bond Measure that allocated $135.6 million dollars to be used for the purchase of and protection of key natural areas, trail corridors and greenways. The purpose of the bond measure was to help link these acquisitions with other existing open spaces and to purchase additional key properties that would be protected and managed. The overriding goal of the bond measure was to provide this and future generations the benefits of clean water and air, and access to nature for passive recreation such as picnicking, hiking, fishing and boating. As of September 30, 2003, Metro has acquired more than 7,960 acres.

Prior to the bond measure in 2000, Metro had formed a Green Ribbon Committee for the purpose of studying, prioritizing and recommending funding opportunities of the more than 30 Metro open space sites that could be selected for providing public access within the next few years. The committee was comprised of seventeen individuals representing a vast range of experience in park issues including citizen advocates, and officials of local and regional jurisdictions. After site visits and evaluations, the committee reduced the considered sites down to fifteen. Wilsonville Tract was identified as one of four "anchor sites" that deserve top priority for public investment. The committee recommended to Metro that a challenge grant program be implemented to allow local jurisdictions to improve their respective sites.

FOG5 worked closely with DSL and Metro to campaign for successful passage of the Greenspaces Bond Measure. The bond measure included the Wilsonville Tract as one of the regionally significant open spaces for Metro acquisition. On May 24, 2001, Governor Kitzhaber joined Metro, FOG5 and the community of Wilsonville in celebrating this important regional acquisition.

## Mission Statement

Establishing a strong mission statement kept the Tract master planning process in focus. The mission statement was formulated after in-depth analysis and discussion of issues and opportunities presented by the project team and the Stakeholder Advisory Committee (SAC). It was acknowledged that with such a flexible and seemingly generous open space, there was a large potential to

meet suitable public recreation needs on the site. However, the group understood and maintained that the underlying purpose of the Master Plan is as follows:

> "To preserve, restore and enhance the natural resources of the Wilsonville Tract."

## Master Plan Goals

With this overall mission in mind, the City, Metro, Stakeholder Advisory Committee and consultant team developed the following goals throughout the master planning process:

- Preserve the existing natural features of the Wilsonville Tract.
- Restore and enhance existing natural resources for ecological diversity.
- Comply with the Metro Open Spaces Bond Measure regarding appropriate recreational uses and activities on the property.
- Establish the site as a regional destination for people and wildlife.
- Plan for trail connections to the Wilsonville Tract.
- Protect natural areas while providing appropriate passive recreational opportunities, such as trails, on site.
- Provide the necessary support elements for trail usage.
- Provide a safe and convenient north-south pedestrian and bicycle connection through the property from the Villebois development to the adjacent middle and elementary schools.
- Provide interpretive information, educational programs and opportunities.

## Master Plan Program Elements

It was generally acknowledged by participants of the master planning process that some usage of the Tract by the general public is desirable, and that the property is not necessarily a wildlife preserve to the exclusion of people. However, site improvements must be limited, located with respect to sensitive areas and carefully balanced with the natural resources of the site. In order to plan physical site improvements, a preliminary list of site program elements and features was developed by the City and project team with assistance from the SAC and community members. Elements include the following:

- Creek bed and hydrological restoration in certain locations.
- Native re-vegetation and habitat restoration using appropriate plant communities.
- Pedestrian and bike linkages to adjacent properties.
- Linkages to regional open spaces in the area.
- Future linkages to the Willamette River.
- Limited and controlled pedestrian access.
- Limited vehicular access and parking.
- Picnic shelters at main trailheads.
- Restroom facilities near trailhead with parking.
- Continuous trail loops, with no “dead-end” trails.

Mayer/Reed

Project team on site walk

- A hierarchy of trail types, as appropriate for different areas and uses.
- Educational, directional and regulatory signage.
- Interpretive information features.
- Viewing opportunities, both scenic and wildlife.

## Public Involvement & Planning Process Summary

The Wilsonville Tract master planning process involved citizens and solicited active participation from representatives of the region, greater community and neighborhoods. Many opportunities were provided to engage in informal dialog with residents and other stakeholders to participate in a thoughtful and well-informed master plan.

Mayer/Reed

Project team on Wilsonville Tract

The City of Wilsonville initiated and completed an extensive search for community members within the region to serve as liaisons between the project team and other community members to participate in a Stakeholder Advisory Committee. A series of three public open house meetings were organized to provide an opportunity for the public to take an active role in the planning process.

### Project Team

The core project team included City of Wilsonville staff, Metro representatives and the consultant team. The consultant team was led by Mayer/Reed, a Portland-based landscape architecture firm. The team was responsible for the design, planning and environmental evaluations. The consultants gathered data, analyzed the site, facilitated the planning process, developed plans and prepared the master plan report. Subconsultants included Inter-fluve, Inc. that oversaw the hydrological and watershed issues; and Fishman Environmental Services that conducted environmental evaluations, assisted with project planning and was the lead author for the Natural Resources Management Plan.

### Stakeholder Advisory Committee

The Stakeholder Advisory Committee (SAC) was composed of seventeen members representing the following interests, agencies or organizations:

- Clackamas County Planning Staff
- Wilsonville Planning Commission
- Wilsonville City Council
- Wilsonville Parks and Recreation Advisory Board
- Friends of Goal 5
- Villebois Design Team
- Living Enrichment Center
- CREST
- Neighborhood representatives
- Teachers and students from the West Linn/Wilsonville School District.

The SAC met four times during the master planning process. The purpose of the meetings was to understand community needs and desires, react to design and management proposals, and advise on project planning, policies and issues. Three SAC meetings preceded the public open houses.

## Public Open Houses

Three public open houses were held at important junctures during the master planning process. Mailers and public announcements advertised the events.

The format of the public open houses allowed an informal, comfortable atmosphere for people to meaningfully participate in the planning process and have personal dialogue in a non-confrontational manner. Methods for input included both small group and one-on-one discussions, comment cards and mailers. Participants were also encouraged to review presentation materials and apply comments directly to many of the displays. City and Metro staff, the consultant team and SAC members were present to answer questions, record comments and take suggestions. In response to these comments, the master plan was further developed and refined. Reference Appendix C for complete meeting notes and alternative design schemes.

## Public Open Houses and Meetings Summary

The following paragraphs summarize the presentation materials and content of the series of open houses:

**Public Open House Number One**
**October 1, 2002**

The first public open house introduced the public to the Wilsonville Tract master planning process, project schedule, and the roles of Metro and the City of Wilsonville. Members of the project team compiled additional background information from community members and neighbors. Participants were given a brief presentation and overview of the project. Participants were then encouraged to informally review and comment on a series of graphic presentations arranged in stations by the following topics:

- Project description
- Goals and objectives
- Timeline and schedule
- Regional context; natural resources, geology, transportation, trail connections and adjacent land uses
- Site features and topography
- Site natural resources

**Public Open House Number Two**
**October 30, 2002**

The second public open house provided an opportunity for the public to review and comment on several alternative design schemes and ideas that were generated and illustrated by the project team. Alternatives were based on work by the project team with City staff, Metro, the SAC and public input gathered at the first public open house. Participants were invited to listen to a brief introduction and an overview describing the three alternative design schemes listed below:

Scheme #1 - Successional Recovery Open Space. This scheme most strongly acknowledged the concept that ecological and wildlife habitat recovery was the first and foremost purpose of the open space. Proposed human use consisted of a trail network and minimal facilities to support the limited passive recreational uses. Existing agricultural operations were proposed to be phased out over time and native plant communities were to be restored. Deciduous and coniferous forest, oak forest, oak savannah and wetlands would be extended into the existing fields through a successional, ecological recovery program. This concept was derived from diverse eco-types, soils, topography, hydrology and remnant forests that already exist on site. Specific areas of restoration, such as Legacy Creek, were proposed to be a top priority for recovery.

Scheme #2 - Educational/Interpretive Site. Scheme #2 capitalized on the site's potential for education given its close proximity and relationship to the schools and CREST. While site recovery, as described above, was still an important aspect, this scheme offered

an extended role for the Wilsonville Tract to become a site of public education for the region. The existing open space was proposed as a gathering space for outdoor programs, events and community celebrations that support the overall notion of ecology in balance with human activity and interests.

Scheme #3 - Managed Agricultural Habitat
Similar to the two previous schemes, Scheme #3 had minimal facilities to support limited passive recreational uses. However, the focus of Scheme #3 was to capitalize on existing agricultural uses of the site and demonstrate how managed agriculture could play a part in providing new habitat for certain migratory wildlife. This concept was based on the success of managed agricultural practices as demonstrated at the Finley National Wildlife Refuge located near Corvallis, Oregon.

After the design scheme presentations, participants were encouraged to informally review and comment on the presentation. Input and comments from the second public open house led to the selection of Scheme #1 as the concept that best met the project mission and goals and the intent of the Metro Bond Measure.

**Public Open House Number Three**
**January 22, 2003**
The third public open house provided an opportunity for community members to review and comment on project goals and objectives and the refined master plan concept. Participants discussed aspects of preferred land management practices, use policies, site restrictions and recommendations generated by public agency representatives and the project team.

At each public meeting, suggestions were taken for a new name for the Wilsonville Tract. It is hoped that a new name will convey the importance of the site and use as a preserved open space, rather than the traditional concept of a public park. Many suggested names reflect the site history, special experiential qualities or natural resources. The suggested possible names from the public meetings are included in Open House Summaries, Appendix C.

**The Park at Merryfield Neighborhood Association Meetings**
**April 3, 2003 and May 15, 2003**
Two additional neighborhood meetings were held with residents of the Park at Merryfield Neighborhood Association that abuts the Tract. The residents' focus for the April 3rd meeting was to discuss the conceptual trail alignment on the northeast side of the Wilsonville Tract property. Issues included proximity of the trail to private property, opportunities for buffer landscape, safety concerns, trail usage, noise, access to private property and public property encroachments. Most people who attended supported the overall concept of the plan, but needed more discussion on trail alignment. Attendees of the neighborhood association meeting were invited to further participate in a site walk to help determine the trail alignment.

The second meeting was held as a site tour to review the proposed alignment of the trail. City staff, Metro representatives and the landscape architect led the tour with neighborhood association representatives and some of the adjacent private property owners. An approximate trail alignment was walked and, in places, adjusted to achieve more privacy and a more generous buffer for residents. This alignment was field documented on a 1"=100'-0" scale map.

# Site Analysis

Wilsonville Tract Study Area

History

Bioregional Significance

Surrounding Land Use/Ownership

Transportation & Site Access Opportunities

Site Visits

Natural Resource Inventory & Analysis

Site Characteristics

# Site Analysis

## Wilsonville Tract Study Area

The Wilsonville Tract, in many ways, typifies much of the present landscape character of the Willamette Valley. The site includes open fields with gentle rolling topography, some well-defined riparian corridors, wetlands, coniferous forests, mixed deciduous woodlands and the uniform grid of a filbert orchard. Extensive views to the Cascade Range and Mt. Hood, in part, help define the regional sense of place. One centrally located, large native Oregon white oak tree is a focal point and a sentinel within the agricultural open space enframed by forest and wetlands.

The following paragraphs provide brief summaries of different aspects of the natural and cultural history of the site as well as physical site characteristics. The Natural Resources Management Plan, included as Appendix A, provides more in-depth scientific information regarding the site.

## Wilsonville Tract History

### Geology

Glaciations, volcanic eruptions and earthquakes, in addition to cataclysmic floods, created large-scale disturbances within the region. The Wilsonville Tract inherits much of its geologic character from these large-scale events that shaped the Willamette Valley over time.

The Willamette Valley lies between the Cascade Range to the east and the Coast Range to the west. Deep soils and gentle topography characterize the Willamette Valley. During the last ice age 15,000 to 17,000 years ago, a series of catastrophic floods from glacial Lake Missoula inundated the Willamette Valley with water as deep as 400 feet. This inundation, followed by a period of draining, occured at least forty times in the Willamette Valley. Floods left behind the characteristic silt soils and large glacial erratic rocks.

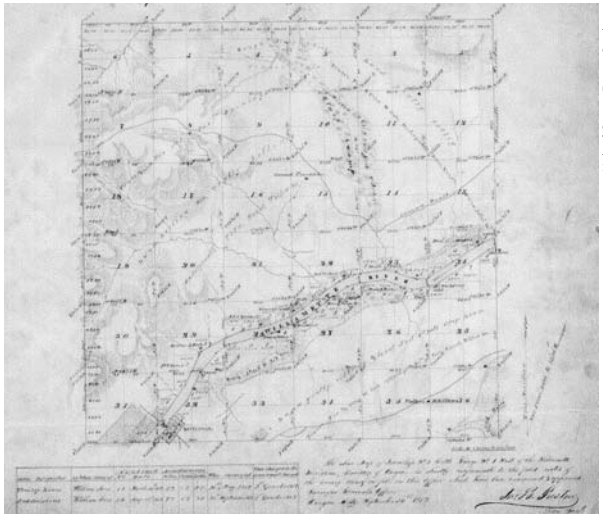

Map of the WIllamette Valley

During peak floods, the Wilsonville Tract site is believed to have been covered with water deeper than 200 feet numerous times.

## Cultural History

The Kalapuya Indians are known to have lived in areas along the Willamette River, in what is the present day City of Wilsonville. According to the historic survey of 1852, Township No. 3 South Range No.1 West of the Willamette Meridian prepared for the Surveyor General's Office, the Wilsonville Tract lies just south of a trail frequented by Native Americans. Because of the close proximity to the historic Native American trail, the site may have been used as summer travel grounds.

Later, in more recent history, several homesteads made up what is today the Wilsonville Tract property and the surrounding area. According to the 1852 survey, one of those historic homesteads established just south of the Tract along the Willamette River belonged to Col. Alphonso Boone, grandson of Daniel Boone. Alphonso Boone was one of the first European American settlers in the area.



United States Forest Service

1852 Historic Survey

The area was officially named Wilsonville on June 3, 1880 after the local postmaster, Charles Wilson. Residents in the area voted to incorporate the city in 1968. The City of Wilsonville is presently home to over 15,000 residents and is estimated to grow significantly by the year 2015.

A variety of uses have been proposed for the Wilsonville Tract property over the years. Some of the proposed uses included a women's prison, a full service 18-hole golf course and a National Guard vehicle maintenance facility. More recently, the Tract was considered as a site for The Oregon Garden, a botanical display garden now located in Silverton.

## Vegetative History

Evergreen conifers originally dominated the forested landscape of the region, but portions of the site may have been managed with fire as an oak savannah by Native American populations to attract game. In the early 1900s, logging was a major economic contributor to the growing European American populations of the area. Most forested portions of the Wilsonville Tract property were logged, with the exception of a few old growth conifers that remain standing today.

Historically, the area east of the steeply sloped creek ravines was very suitable for farming and was graded and tilled, or grazed. Clay tiles, to enhance site drainage, were set in low-lying swales in the central area of the open fields. Drainage tiles increased the tillable area, created more uniform soil conditions and concentrated

water flow to the adjacent streams. The tile system daylights into the nearby Mill Creek watershed to the west. The unnamed creeks in the Mill Creek watershed are referred to as Legacy Creek, Indian Plum Creek and Pristine Creek in the master plan. The agricultural lands, now in production for grass seed, are presently leased by Metro to a private farmer.

A six-acre filbert orchard, located in the southwest portion of the site adjacent to Wilsonville Road, was an Oregon State University Eastern Filbert Blight Research Facility from 1960-1979. Currently, the filbert orchard is managed by a private tenant for commercial filbert production, also by lease with Metro.

## Bio-Regional Significance

As the Portland metropolitan region grows in population, development activities continue to encroach on existing wildlife habitat. Therefore, a regional interconnected network of forest patches and open spaces, each large enough to accommodate viable populations of wildlife, is critical for protecting bio-diversity. The Wilsonville Tract is one of many regionally significant open spaces that Metro has been able to acquire and protect for this purpose.

The Wilsonville Tract currently provides habitat for many wildlife species. A restored Wilsonville Tract allows a greater opportunity for the preservation of genetic diversity for both plant and wildlife populations in order to help them withstand various natural and human-induced stresses. The Tract is also remarkable in that it contributes to the regional interconnected system of diverse natural resources, all on one site.

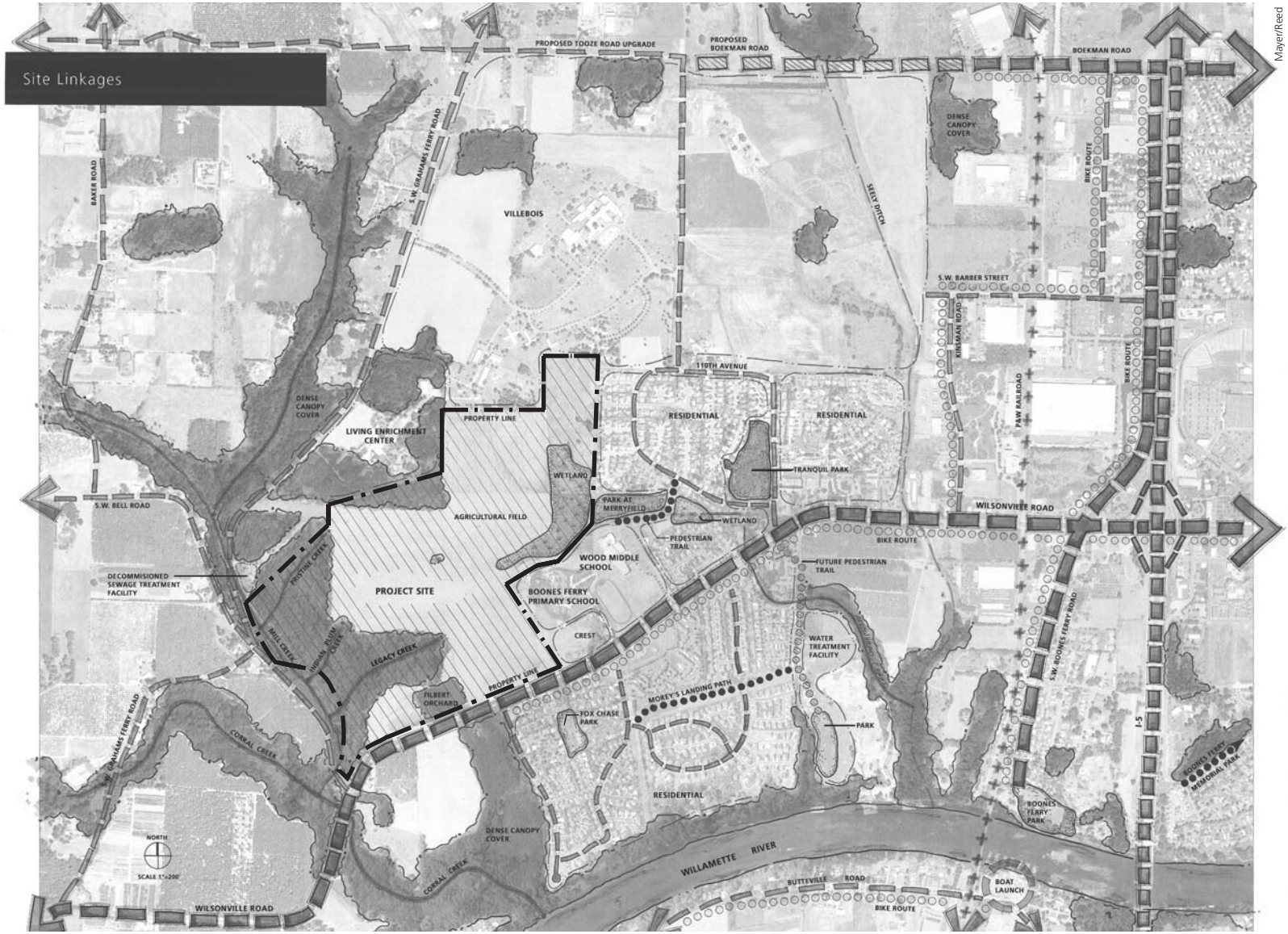
## Surrounding Land Use/Ownership

The Wilsonville Tract is presently zoned for farm and forest use. The site lies directly outside the City of Wilsonville's Urban Growth Boundary and city limits. Portions of land surrounding the Wilsonville Tract are very characteristic of developed suburban communities of the region. However, on the north, a new mixed-use urban village called Villebois is intended to be a model of higher population density through a variety of housing types with planned open space. Neighboring land uses are described in the following paragraphs:

### North

The Wilsonville Tract is bordered on the north by the former Dammasch State Hospital, which was closed in 1995. The site is a 190-acre property with a complex of institutional buildings and twin water towers that are visible from the Wilsonville Tract. The City of Wilsonville is currently working with Costa Pacific Communities to master plan approximately 480 acres, called Villebois. This new development, to be phased over 7-12 years, will consist of a minimum of 2,300 housing units, a mix of housing types, retail, parks and open space, and the associated infrastructure of streets, sidewalks and utilities. Construction is scheduled to begin in 2004. Villebois is expected to develop a surface water management plan for its storm water, so that drainage from the site will resume historical patterns in the landscape. For clarity purposes this master plan will refer to the site as Villebois.

The Living Enrichment Center, a 42.8 acre private religious facility that serves a multi-denominational congregation, is located just northwest of the Wilsonville Tract adjacent to the Villebois site. The property contains wetlands, is well forested and features a large conference center, parking lots, small retreat building, cabins and a private trail system for use by congregation members.




Site linkages and surrounding land use

## East

The Park at Merryfield, a single-family neighborhood, borders the Wilsonville Tract on the northeast side. Some of these homes are directly adjacent to the Tract property. A public park with trails was established as part of the Park at Merryfield development. The park contains a very intact, however isolated, example of a mature wetland ash forest.

Directly east of the Tract, three educational institutions compose an extensive public campus. The institutions are Boones Ferry Primary School, Inza R. Wood Middle School, and the Center for Research in Environmental Sciences & Technologies (CREST). The schools are large, institutional scale buildings that are very visible from the Tract. During school hours, the schools are a source of audible disturbance. However, the public schools offer large expanses of open space, even though much of the sites are maintained with mowed lawns for active recreational sport fields. The primary school has a bioswale storm water treatment facility on site that contributes to wildlife habitat. As a benefit to the Wilsonville Tract, public parking is available at the school sites that may be used on weekend and off-peak times. Science programs offered by the schools can be expanded to incorporate aspects of the Tract.

The CREST is an environmental education center for students grades K through 12. CREST offers and promotes the following: hands-on learning opportunities, student research, inquiry-based learning, green technologies, recycling & composting, organic gardening, mentoring, service learning, resource conservation, field experience, community partnerships and internships. The CREST is an ideal neighbor to the Wilsonville Tract, given the potential for community partnerships, involvement of CREST participants and promotion of the respective educational and interpretive missions.

Bob Carlson, Director of CREST, was a member of the SAC who contributed greatly to the process through his ability to lend positive support to the Tract project. Bob understands the environmental value of the Tract, benefits for the children he educates and how the Tract will benefit from his programs. A portion of the land between the CREST building and the Tract site was designed to be a gateway, linking natural resources and interpretive programs.

## South

The southern border of the Tract is Wilsonville Road, the primary, most direct transportation route to the site. Wilsonville Road is a busy arterial and was recently improved to include bike lanes, sidewalks and street trees. South of Wilsonville Road are single-family residences, which make up the Fox Chase and Rivergreen subdivisions. West of Fox Chase, across from the Tract, are agricultural lands and managed filbert orchards. The Willamette River is immediately south of the Rivergreen Neighborhood.

## West

Southwest Bell Road, a two-lane, unimproved rural road, splits at a Y intersection to Grahams Ferry Road. Southwest Grahams Ferry Road borders the west side of the Wilsonville Tract. The roads lack adequate shoulders and are too narrow for trail or vehicular access. To the west of SW Bell and Grahams Ferry Roads are several large single-family properties, either forested or containing small-scale agricultural use.

The Oregon Department of Administrative Services currently owns 16.67 acres between the Tract and Grahams Ferry Road at the northwest corner of the site. This parcel is the site of a former sewage treatment plant that served Dammasch Hospital. The plant was decommissioned in 2002 and the Oregon Department of Administrative Services has expressed interest in selling the property.

## Transportation & Site Access Opportunities

The study area was evaluated to explore opportunities for site access through various transportation modes. The perimeter of the site was analyzed to understand what points are currently used for access and what points are best suited for access and pedestrian connections in the future. Eight locations around the site were identified as providing potential access. The access points were further studied as to the priority for different modes of transportation. These locations are discussed in the following paragraphs:

### Automobiles

The Wilsonville Tract is most directly accessed via Wilsonville Road from both the east and west directions. The only existing vehicular entry onto the Wilsonville Tract property is an unpaved agricultural road that provides localized access to the fields and filbert orchard. Future road improvements would have to be made on SW Bell or Grahams Ferry Roads in order to have vehicular, bike or pedestrian access. No road improvements are planned at this time. Parking is available at the elementary and middle school sites and the CREST immediately adjacent to the tract.

### Public Transit

The South Metro Area Rapid Transit (SMART) Route 204 provides access via Wilsonville Road and makes a stop at Boones Ferry Primary School near the CREST.

### Pedestrians

Sidewalks along Wilsonville Road currently provide easy pedestrian access from the neighborhoods to the south. Students, visitors and community volunteers enter on the east side of the Tract through the CREST and Boones Ferry Primary School properties. The Park at Merryfield neighborhood has no direct public access presently, other than through the paved pedestrian trail connecting through the park to Wood Middle School and some random, de-facto foot trails. However, there is potential to locate a small trail through the north side of the public Merryfield Park that would provide a legitimate point of public access for the neighborhood.

Currently, there are no formal pedestrian connections to the future Villebois development or to The Living Enrichment Center, although plans include connections to these sites. There is an informal pedestrian access point just north of the intersection of SW Bell Road and Wilsonville Road near the confluence of Mill and Legacy Creeks. This access is primarily used by local high school educators for taking students on water quality research field trips to collect samples and data.

The Wilsonville Tract presently has a footpath constructed by community volunteers through the large forested area. The condition of the trail varies from good to somewhat unsafe in places, where erosion has affected the stability of the slope. This trail starts just north of the filbert orchard and connects to the open space at the southwest corner of the central agricultural fields.

On a larger scale, the tract will become an important link as part of a regional north-south hiking and bicycle trail that is envisioned to extend from the Tualatin River National Wildlife Refuge through the Tonquin Scablands and Geologic Area to the Willamette River. The Tonquin Trail, as identified on Metro's Regional Trails Plan, provides an important regional connection and will pass through the Villebois site and the Wilsonville Tract prior to its final descent to the Willamette River.


Mayer/Reed

Project team on the Wilsonville Tract

### Bicycles

The Wilsonville Tract can be accessed via dedicated bicycle lanes on Wilsonville Road. Southwest Bell Road and Grahams Ferry Road are not adequate for bike usage due to minimal shoulders and limited sightlines. Present conditions suggest the need for future roadway improvements to include safer bicycle access along these roads. In the future, connections to the north side of the site will be possible through the Villebois development and to the east through the school properties.

## Site Visits

### Wilsonville Tract

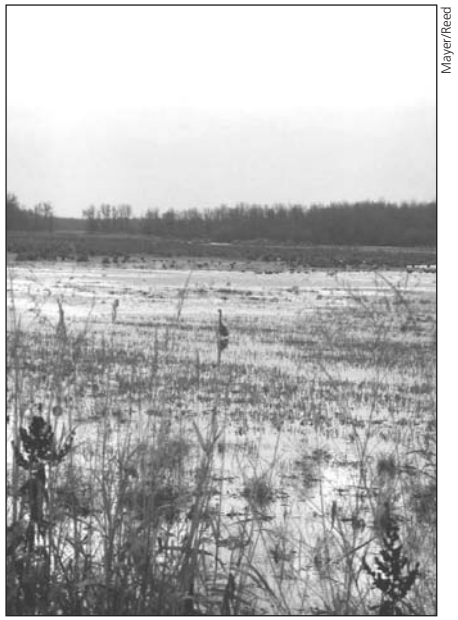
The project team, City of Wilsonville staff and SAC members visited the site a number of times during the master planning process. Site visits provided the following benefits:

- An orientation to site natural resources and features.
- Scientific research and assessment.
- Photography and documentation of existing conditions.
- Personal experience with different aspects of the site and its usage.

### Finley National Wildlife Refuge

Members of the project team, City staff and SAC visited the Finley National Wildlife Refuge located southwest of Corvallis, Oregon in the Willamette Valley and received a guided tour given by Carol Schuler, the Project Leader/Willamette Valley Coordinator for the US Fish & Wildlife Service (USFWS). The purpose of the field trip was to assess the feasibility of agricultural practices for managing wildlife in the context of the Wilsonville Tract Master Plan. In addition, the field trip provided an opportunity to learn about models for oak savannah and woodland habitat, forest and wetlands restoration, and management. Visitor improvements and methods for resolving human/wildlife conflicts were also discussed.

The Finley trip helped confirm for the project team that developing as much diversity in habitat types as possible will ultimately be most beneficial to wildlife, and more interesting to visitors of the Wilsonville Tract. The limited size of the Tract and its proximity to human populations led the


Mayer/Reed

Finley Wildlife Refuge

team to better understand its differences compared to the site with more diverse development and management challenges. The Tract has a stronger potential to support on-site and adjacent educational programs, rather than managing the land to focus on agriculture practices that specifically attract a single species of wildlife, such as Dusky Canada geese at the Finley National Wildlife Refuge.

## Natural Resource Inventory & Analysis

The project team collected natural resource information and incorporated site characteristics into suitability studies. Site analysis led to identification of environmentally sensitive areas as well as opportunities for recovery of natural systems, vegetation and hydrologic modifications on the site.

Out of data collection and analysis work, the Natural Resources Management Plan was developed for the Wilsonville Tract (included as Appendix A). The Natural Resources Management Plan covers the following topics:

- Natural history
- Cultural history
- Soil types and slope analysis
- Hydrology
- Site vegetation and plant communities
- Wildlife

## Site Characteristics

The following paragraphs generally describe the main landscape typologies and qualities of the Wilsonville Tract site:

### Agricultural Fields

The most extensive, observable landscape on the Wilsonville Tract from Wilsonville Road is the 135-acre central agricultural open space currently being farmed for rye grass seed production. The fields are gently contoured with slopes between 0-8%. The agricultural fields in the central portion of the site have distinct, straight edge conditions that contrast with the mixed deciduous and coniferous forest envelope on the west, south and north sides. Other smaller agricultural fields on site are located south of the forest, adjacent to Wilsonville Road. Birds of prey utilize agricultural fields for hunting rodents. In summer, cracks in the clay soil reveal a plethora of small tree frogs.

Current agricultural practices control the spread of invasive plants that would otherwise become a thicket of Himalayan blackberry, Scot's broom and other species that are very difficult to eradicate. While drainage tiles carry some run-off from the fields, erosive rills carry surface water and fine soil sediments from the fields to the creeks. Along with the surface water, chemical applications of herbicides used in agriculture practices may be washed into waterways via drainage rills. Downstream neighbors notice changes in the water quality over the course of a season.

The open agricultural landscape allows spectacular views of Mt. Hood and the foothills of the Cascade Mountains. As the metropolitan area increases in development density, views to the mountains are lost by many residents. Visual connections to these landmarks are to be preserved and treasured as part of the heritage of the Willamette Valley. In addition, views west to the hills outside of Sherwood and Newberg are also visible from the central open space. The mountain and other landform views from the site are compelling and contribute significantly to the experience of the Wilsonville Tract.


Site opportunities and constraints

Mayer/Reed

Wilsonville Tract agricultural field

## "The Lone Oak"

A remnant Oregon white oak stands in the middle of the agricultural field located in the central portion of the site. This tree is thought to be 150-200 years old. The open agricultural landscape surrounding the "Lone Oak" sets this tree well apart as a sentinel from the surrounding coniferous forest. The majestic oak provides a reference point and visual attractor, drawing visitors into the central portion of the site. The "Lone Oak" is characteristic of the Willamette Valley landscape in that farmers would often save a single tree or grove of native oaks as a place of respite and a break from the summer sun. The existence of this tree brings to mind the changes of the site over time, as it somehow survived generations of human activities such as logging and farming.

## Wetlands

Adjacent to The Park at Merryfield neighborhood along the east property boundary are seasonal wetlands that drain to Arrowhead Creek. The wetlands are believed to be a remnant of what may have been a more extensive area further north and east. Agricultural practices and adjacent land development have significantly reshaped the land, and therefore changed the wetland regime.

The wetlands are primarily composed of herbaceous vegetation with pockets of small woody plants, occasional trees and numerous invasive species such as English hawthorn and reed canarygrass. Dense vegetation, bramble thickets and wet soils make much of the area inaccessible to pedestrians. However, numerous animal trails can be seen through the underbrush. Wetlands near the primary school are more open and the standing water is visible at many times of the year. The wetlands attract a number of waterfowl, amphibians and insects. Mudflats, when the water seasonally draws

Mayer/Reed

Wilsonville Tract "Lone Oak"

down, reveal a number of wildlife tracks of birds and small mammals that are attracted to this environment. The wetlands drain eastward through an ash and cottonwood forest in the Merryfield park and then into Arrowhead Creek. Some of the original wetlands can be recovered through site grading and revegetation. There is also potential to utilize recaptured storm water run-off from Villebois for storm water treatment that has potential to improve water quality and expand wildlife habitat.

A small triangular wetland overtaken by reed canarygrass is adjacent to The Park at Merryfield subdivision on the northeast portion of the site. This wetland appears to be present as the result of a storm water outfall pipe from the development.

An existing plateau north of Boones Ferry Primary School and west of the Park at Merryfield was created by grading operations and placement of excess fill material from the original development of

Mayer/Reed

Wilsonville Tract seasonal wetlands

Mayer/Reed

Wilsonville Tract filbert orchard

the Dammasch State Hospital. The plateau, however unnatural as a landform, affords nice views overlooking the wetlands and open space of the property.

## Filbert Orchard

A filbert orchard covers approximately 6 acres and contains approximately 460 trees that are currently managed for commercial purposes by a tenant farmer. Filbert orchards are a tradition and important agricultural industry in the Willamette Valley. The orchards are particularly interesting to experience, since the density of trees and the low level canopies create the sense of an expansive dark, outdoor room. The filbert orchard attracts some wildlife; however commercial nut production necessitates routine herbicide applications to clear the ground of vegetation and prevent filbert blight. Filbert orchards need to be actively maintained or taken out of production and removed due to the blight that affects other orchards remaining in production.

## Forest

Located on the western portion of the Wilsonville Tract, the forest is bordered on the south by Wilsonville Road, on the west by SW Bell Road, and on the east by agricultural fields. The dominant trees in the forest are Douglas fir and bigleaf maple with some western red cedar and red alder. Vine maple is a characteristic understory tree throughout. Invasive species such as English ivy, Himalayan blackberry and stinging nettle are present in portions of the forest.

Three stands of old growth conifer trees have been surveyed. One old growth stand is located northwest of the filbert orchard trailhead. Another old growth stand is west of the filbert orchard. The third stand is located between SW Bell Road and Mill Creek in the central portion of the coniferous forest. The old growth conifers are estimated to be about 700 years old, far exceeding the typical age and height of trees now commonly found in the region. The volunteer-maintained pedestrian trail traverses through the forest, passing near the old growth conifers.

The topography of the forest is steep to gently rolling, with the majority of the slopes at or above 20%. The largest stream in the forest, Mill Creek, is a tributary of the Corral Creek. Three side creeks are tributaries to Mill Creek in the forested portion of the Wilsonville Tract. Pristine Creek is located in the north part of the forest, carrying surface run-off from the "Triangle" forest, Living Enrichment Center and beyond. Indian Plum Creek carries run-off from the central agricultural area and Legacy Creek is the southernmost stream.

Legacy Creek collects surface water from the agricultural fields. However, an outfall pipe that carries water out-of-basin from the Villebois site has severely impacted the drainageway over time.


Mayer/Reed

Old growth stand in the forest

Headcut erosion and slope failure has led to unstable conditions and loss of mature trees. The outfall pipe is located at the eastern edge of the forest and is currently undercutting the banks of Legacy Creek. Severe erosion of the side slopes as well as the creek bed along Legacy Creek is evident due to the large amount of water conveyed through this man-made outfall. For further information, refer to Site Restoration in Appendix A.

## "Triangle" Forest

The "Triangle" forest is located north of the central agricultural portion in the northwest corner of the site and extends into The Living Enrichment Center property. Pristine Creek, a tributary of Mill Creek, runs through the west end of the "Triangle" forest. The dominant trees are Oregon white oak and Oregon ash mixed with Douglas fir, bigleaf maple and beaked hazelnut. Invasive species such as Himalayan blackberry, English ivy and reed canarygrass are present throughout this area.


Mayer/Reed

Slope analysis/sensitive areas

# Wilsonville Tract Master Plan


Purpose

Goals and Objectives

Summary of Site Improvements

Ecological & Wildlife Restoration

Master Plan Components

Summary of Site Management Recommendations & Strategies

Recommended Next Steps

Plan Implementation and Phasing

Conclusion

# Wilsonville Tract Master Plan

## Purpose

The Wilsonville Tract Master Plan is based on a composite of the natural resources and potentials for ecological recovery, the desires of the community, inherent opportunities and constraints of the natural character of the site, and resolution of issues presented by local agencies and jurisdictions.

The project is a model for public education and environmental stewardship, especially given the site's close proximity and relationship to Boones Ferry Primary School, Inza R. Wood Middle School and the CREST. The Tract is intended to be a model of restoration ecology in balance with human activity and interests.

The master plan will guide physical improvements that support the ecological goals and human activity. This document, a result of consensus building through informed choices and scientific data, will be used by public agencies to gain public support, build partnerships in the community and apply for funding to implement phased projects over time.

## Goals and Objectives

The following goals and objectives were presented, discussed and refined over the course of the master planning process:

1. Preserve the natural features of the Wilsonville Tract.
    - Promote successional recovery and ecological diversity of the existing forests and wetlands.
    - Minimize impacts of human and domestic animals on site.
    - Locate trails on site in areas where they will have the least impact.
    - Feature off site and Mt. Hood views.
    - Restore and stabilize Legacy Creek from damage caused by out-of-basin storm water transfer from the Villebois property to the Wilsonville Tract site.
2. Restore and enhance existing natural resources for ecologic diversity.
    - Expand existing wetlands to historical boundaries as shown on the 1852 survey.
    - Phase out the filbert orchard and agricultural practices.
    - Establish additional wildlife habitat for a variety of species.
    - Identify projects and partnerships for achieving restoration goals.
    - Identify management practices that are most suitable/practical for enhancing or restoring historic habitats.
3. Establish site as a regional destination.
    - Protect, restore and manage site as a natural area that is of regional importance.
    - Create opportunities for wildlife corridors.
    - Identify opportunities for promoting site as a regional natural area.
    - Restore and manage site as a model for attracting diverse species of wildlife.
4. Plan for trail connections to the Wilsonville Tract.
    - Connect the site to future regional trails such as the

Tonquin Trail which will connect the WIllamette River with the Tualatin River.

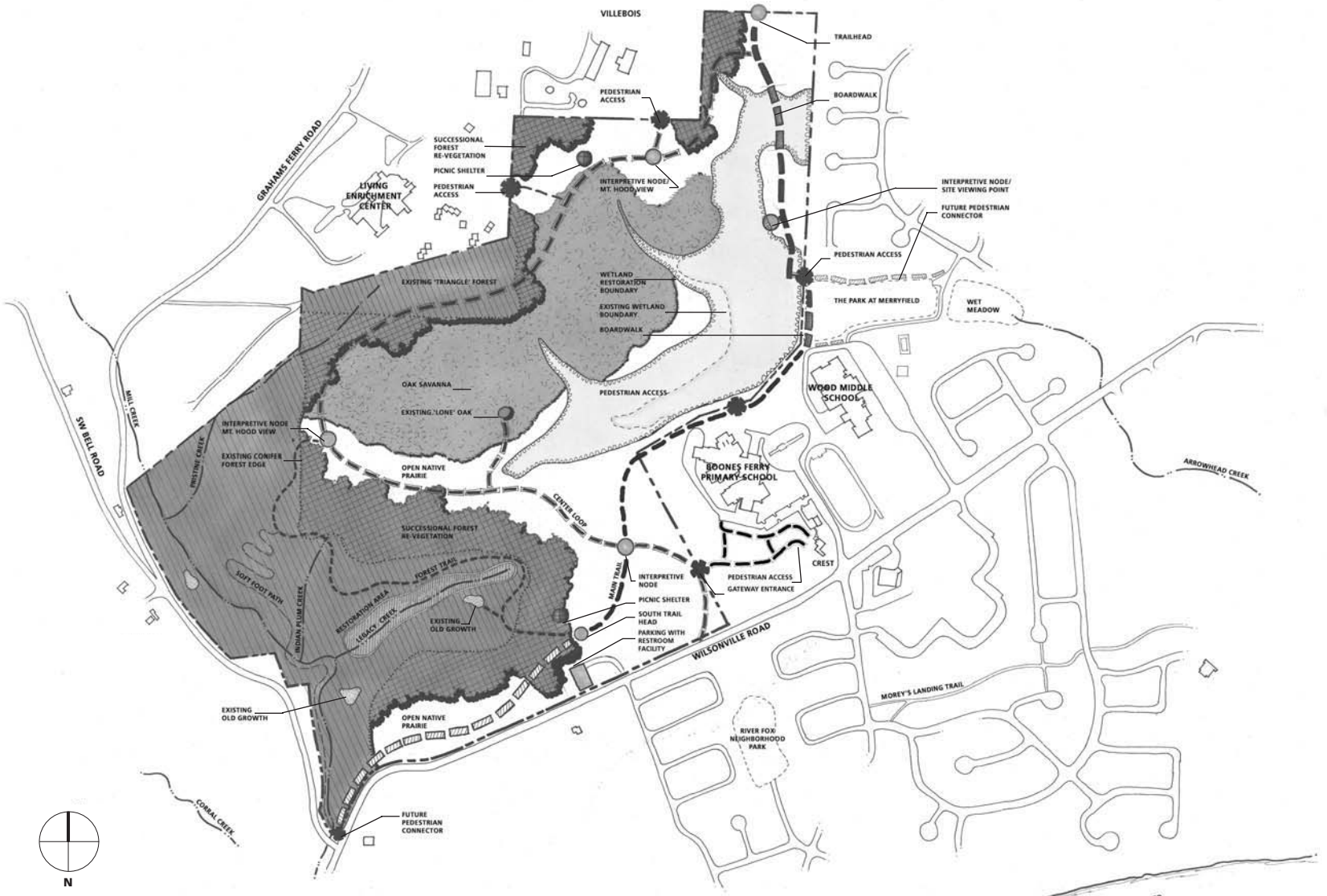
- Connect the site to a future link to the Willamette River.
- Provide connections to existing neighborhoods, adjacent schools, CREST, Wilsonville Road and the new Villebois community.

5. Comply with the Metro Open Spaces, Parks and Streams Bond Measure regarding appropriate and compatible recreation activities on the property that protect natural areas.
   - Provide for activities such as walking, picnicking, bicycling, wildlife viewing and educational experiences.
   - Provide loop trails within the Tract so that visitors can experience the ecological diversity of the site.
   - Provide trailheads at appropriate locations on site.
   - Provide signage regarding visitor protocol and regulations.
6. Provide the necessary supporting elements for trail usage.
   - Locate small parking lot adjacent to Wilsonville Road and encourage use of shared facilities at schools.
   - Provide public facilities such as restrooms, benches, picnic tables, shelters, and wildlife viewing blinds.
7. Provide interpretive information, educational programs and opportunities.
   - Provide connections to CREST and adjacent schools.
   - Identify and prioritize restoration and wildlife management opportunities for students of CREST.
   - Identify interpretive opportunities for the site.
   - Promote access to water quality sampling areas for continued data collection by students.
8. Provide a safe and direct pedestrian and bicycle connection through the Wilsonville Tract property from the new Villebois community to the middle and elementary schools.
   - Provide accessible trails from Villebois to the schools.
   - Provide boardwalks where trails cross sensitive wetland areas.

## Summary of Site Improvements

Physical site improvements of the Wilsonville Tract are summarized as follow:

- Ecological restoration of disturbed lands to include:
  - Legacy Creek ravine
  - Oak savannah
  - Wetlands
  - Successional deciduous/coniferous forest
- Vehicular access and a new parking area off Wilsonville Road to serve the south trailhead. Facilities include picnic shelter, restroom facility, drinking fountain and signage.
- North trailhead located at north property line adjacent to Villebois as the primary north access. Facilities include picnic shelter, signage and on street parking at Villebois.
- Accessible paved main trail running north-south linking Villebois, the schools, and the north and south trailheads. Sections of elevated boardwalk crossing over wetland areas will be required. A portion of this trail north of Wood Middle School will be located on The Park at Merryfield public land.
- Primary gateway access to the tract at CREST. Secondary pedestrian access points at Boones Ferry Primary and Wood Middle Schools, the Park at Merryfield, the Living Enrichment Center and at the SW Bell Road and Wilsonville Road intersection. Signage will be included.
- Accessible soft trail system linking most secondary pedestrian access points with the paved main trail.




**Wilsonville Tract Concept Master Plan**

- Woodland soft surface trails that provide limited access to certain areas of the forest, with one crossing of Mill Creek.
- Educational and interpretive signage at three main nodes along trails to address topics such as geology, ecology, restoration efforts, site history and culture.
- Viewing blinds along trail for wildlife observation.

## Ecological & Wildlife Habitat Restoration

Landscape restoration, on a large scale, is key to meeting the mission of the project. Restoration of Wilsonville Tract will be a phased, on-going project for many years that will require a program of diligent monitoring. The current agricultural use and filbert orchard will be phased out over time and replaced with several different ecological typologies that include oak savannah, successional forest and wetlands.

The extensive oak savannah restoration area will follow the topography and distribution of soils that are suited for this particular landscape typology. The savannah will incorporate the existing "Lone Oak" and open native prairie grasslands as understory. Participants at the open houses said they appreciate the views to and from the Tract and underscored the need to keep portions of the Tract visibly open.

The existing edges of the forest will be blended into the meadows with successional forest re-vegetation. The existing straight-lined perimeter of the current agricultural fields will be softened to reduce the abrupt forest edge and to provide an enhanced and more diverse wildlife habitat. Restoration of the stream corridors within the forest will include bank and slope stabilization, riparian habitat enhancement and water quality improvements. Specifics for the restoration of the Legacy Creek ravine are described in Appendix A.

The existing wetland area will be expanded and restored. Small seasonal streams through the uplands of the site will lead to the lower flat portion of the site. While additional study is required, there is an opportunity to incorporate existing run-off and storm water currently being diverted from the Villebois site as well as from the Tract site itself. The master plan site graphic illustrates the approximate vicinity for expanded wetlands.

Restoration guidelines and management practices to enhance the Tract's natural ecology are referenced in the Natural Resources Management Plan, Appendix A.

## Master Plan Components

### Carrying Capacity of the Site

Given the sensitivity of some of the Wilsonville Tract's natural resources, including the Legacy Creek corridor, the project team understands that improvements to the site will need to be established over the next 20-25 years. It is the recommendation of the project team that periodic evaluations be done throughout the establishment period to determine use patterns and visitor needs. Since there is no exact science in determining the carrying capacity of this open space site, one has to depend on common sense, experience and monitoring to be able to assess the impacts of any given number of visitors. Therefore, monitoring will play a very important role in determining future site needs.

### Wilsonville Tract Access Points

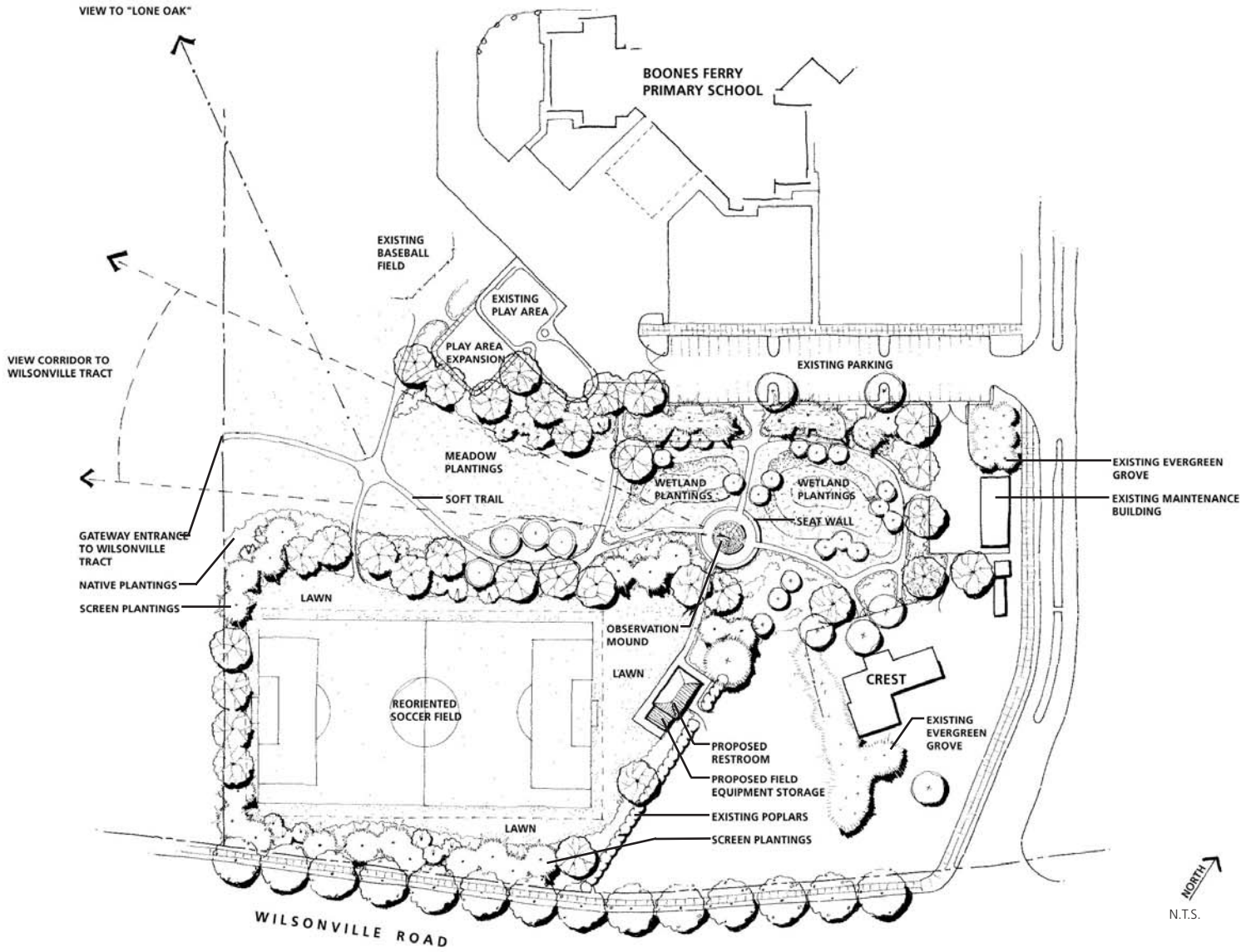
Points of access were carefully considered with respect to guidelines outlined in the Metro Open Spaces Bond Measure and the sensitivities of existing and future natural resource systems. Access points were evaluated for larger, off-site connectivity to local and regional trail systems. Current and future access points were identified from surrounding areas, including the relationship to surrounding neighborhoods and schools. Other factors include site topography, erosion potential and minimal disturbance to natural resources. In addition, issues of public visibility, safety and potential for trespass onto private property were considered.

Given the size of the Tract, eight points of entry were identified for inclusion in the master plan. As described previously, the two primary points of pedestrian access are on the north and south sides of the Tract. The remaining access points are secondary. All points of access will identify that the visitor is entering a protected public open space and that some use restrictions will apply. The specifics of the use restrictions are discussed later in this master plan. Points of access are discussed in greater detail in the following paragraphs:

#### CREST and CREST Gateway

The planned improvements of the Tract represent a unique model of cooperative partnerships among Metro, the City of Wilsonville and the West Linn-Wilsonville School District, which funds and operates CREST, a regional environmental learning center. The adjacency to the Tract's diverse natural resources provides the students at the CREST a hands-on outdoor classroom to assist in the Master Plan's recommended restoration and monitoring activities. Students will have an exceptional opportunity to study indigenous earth systems in their own backyard. These topics include the structure and hydrology of streams, transition of established agricultural crops to oak savannah land, successional forest re-vegetation, and wetland construction, restoration and enhancement for diverse wildlife habitat. The CREST will become the repository center for research documentation and information on the Tract's improvement.

During the Master Plan process a CREST Gateway Plan was designed by Mayer/Reed to strongly link the two properties. The concept plan, with wetlands, meadow and native educational/research planting areas, observation mound with views to the "Lone Oak", pathways and restroom facilities, creates a gateway and view corridor that visually and physically connects the CREST to the Wilsonville Tract. The gateway at the CREST is designated to be the main access point to the Tract and a focal point of the project. The design contains many of the same ecosystems found on the Tract but on a smaller scale. This outdoor laboratory will allow the students to develop, observe and record restoration techniques under more controlled conditions and apply the lessons learned on a larger scale at the Tract. There is also the potential to coordinate educational interpretive displays on the Tract that tie to the programs of CREST and therefore strengthen the connections.




**CREST Gateway Schematic Plan**

**The South Trailhead at Wilsonville Road**
A small parking area will be located off of Wilsonville Road across from the Fox Chase neighborhood. A sign at this entry will identify the Wilsonville Tract as a public open space. This vehicular, pedestrian and bike entry was determined to be the best location for the following reasons:

- It is easily accessible from Wilsonville Road and the location is central to the site.
- The location provides for safe sight distance while entering and exiting.
- The area is already disturbed by agricultural activities.
- Site topography is suitable for parking, other facilities and the trailhead.
- The location provides for the trailhead to be visible and accessible by all users.
- The entry has a high degree of visibility so the Tract is recognizable as a greenspace.

The parking area will be designed to accommodate approximately twelve cars and two buses or motor homes. (Additional parking is available at the school complex and is being planned for on-street at Villebois to the north.) The parking area may need to be controlled with a gate or chains and stanchions so that the lot can be closed after hours. Restroom facility, trash receptacles, an interpretive and wayfinding kiosk, benches, a bike rack, a picnic shelter and trailhead will be developed as visitor amenities. Improvements will be barrier-free.

**The North Trailheads at Villebois**
Two points of access from Villebois are proposed. One north trailhead is located at the northeast part of the site that connects directly to the open space system of the Villebois development. This access point will allow for bike and pedestrian connections to the paved main trail on the Tract.

A secondary trailhead for pedestrians to the west will have a picnic shelter and interpretive node. This trailhead links to the secondary loop system of the Tract and is adjacent to a proposed greenway connection in Villebois. Views of Mt. Hood and the eastern foothills can be enjoyed near this access point.

**The Living Enrichment Center**
An access point on the west side of the Tract is desired by The Living Enrichment Center. In turn, the foot trail system of the Center's private property has been offered to be open to the public.

**SW Bell Road and Wilsonville Road**
Future public acquisition of properties south of Wilsonville Road could provide further trail expansion leading to the Willamette River. The SW Bell Road/Wilsonville Road intersection is envisioned to then accommodate a pedestrian road crossing for this link. When the future trail extension plan is further along, the main paved trail of the Tract will be expanded to this corner.

In the short term, the pedestrian-only access point will provide access to the Wilsonville Tract trail system via a soft foot path. On-street parking is prohibited, so access is limited to educational research teams, who now arrive by school bus. The small, discreet pedestrian access point that is now used for water sampling by high school students will be retained.

**SW Bell Road/SW Grahams Ferry Road**
No pedestrian, bike or vehicular access is anticipated at this time until road improvements are made, due to safety concerns.

## Trails and Related Improvements

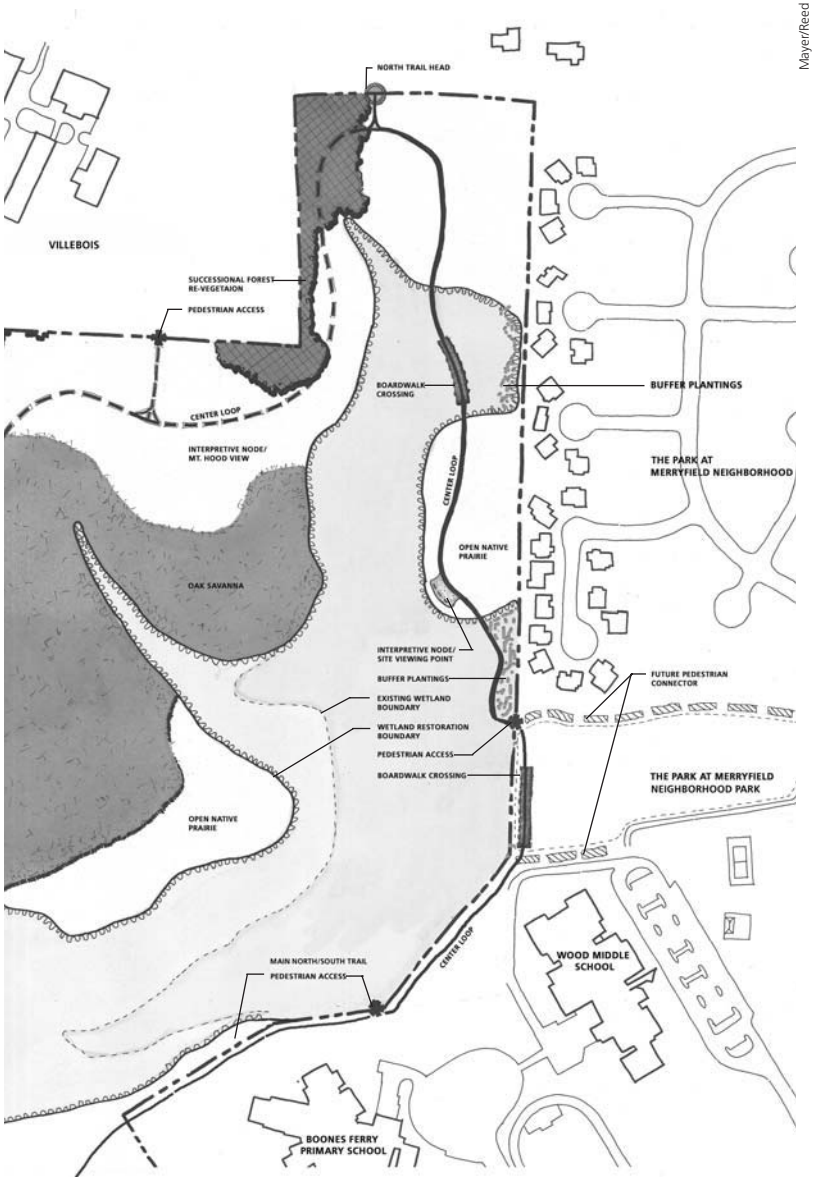
The trail system of the Wilsonville Tract consists of one main paved trail as a north-south connector, a secondary crushed rock surfaced inner loop around the central open space and tertiary trail loops of soft surface materials throughout the forest. The trail system design addresses anticipated visitor desires. The on-site loops provide a great variety of experiences and options, depending on the season, weather and intended length of outing.

### Main Trail

The main north-south trail is a 9-foot wide paved section that is approximately 3/4 of a mile long and provides direct connections between the Villebois development, CREST, the school complex and the south trailhead. In the future, this trail will become part of a much larger regional trail that will extend from the Willamette River, north to Coffee Lake, the Tonquin Scablands and the Tualatin River. A portion of this trail is anticipated to be located on school property and the public park at The Park at Merryfield subdivision to minimize impact to sensitive wetland areas.

The main trail will pass through upland meadows and ash forest, and across wetlands. Elevated boardwalks and creek crossings will be located as landscape conditions and wetlands dictate. Benches and trail maps for wayfinding will be located periodically along this trail.

One particular vantage point that could be developed as an overlook is close to the main trail at the top of the plateau. Much of the site to the south and west can be viewed from this location. Wetlands occupy the foreground and it is anticipated that wildlife would be relatively easy to observe. The overlook is intended to consist of a small paved area with benches and some interpretive displays.




Concept Master Plan partial central loop - east side detail - N.T.S.

**The Central Loop**

The central loop is one that circumnavigates the main open space of the Tract. Connections to the main trail complete the loop system. The central loop trail will provide pedestrian access to some of the secondary access points on the north and west. The trail will pass through five different ecotypes including open native prairie, oak savannah, wetlands, conifer and successional forest edges.

The trail will be located adjacent to wetlands at the north and east sides. Wildlife viewing blinds that overlook the wetlands will be located near this trail. The trail alignment will also afford visitors spectacular views of Mt. Hood and the foothills of the valley to the east and west.

The loop trail design will minimize the impacts to the proposed wetland and oak savannah restoration areas of the site. The loop trail is proposed to be constructed of compacted crushed rock with mowed shoulders to keep vegetation from interfering with the trail. While the main trail is expected to accommodate higher pedestrian use on the east side of the site, this loop will allow a more relaxed tour of the nature preserve.

**Forest Trail**

Approximately one mile of forest loop trail will give access to the wooded portions of the site. The trail will connect to the central loop trail and the south trailhead. The trail will allow visitors to experience the remaining old growth trees and the forested riparian corridors. The forest trail will be sited with respect to slope and vegetation, and primarily stay on the upper elevations of the Legacy, Indian Plum and Pristine Creek drainageways. Soft surfaces of wood chips or bark mulch will reduce trail erosion. No trail will be constructed within sensitive areas. As to the existing footpath, the City, Stakeholder Advisory Committee and the project team felt that portions of the existing trail could be retained. However, within the Legacy Creek corridor, a portion of the trail will need to be re-routed due to safety concerns, severe slope instability and creek bank erosion. The exact trail location will need to be field verified. A crossing at Mill Creek will require a small wooden bridge.

A summary of trail improvements is included in Trail Types & Construction Details, Appendix E. Trail construction guidelines referenced in Appendix A, Natural Resources Management Plan, are recommended to avoid impacts to the natural ecology of the site and to diminish the potential for trail and soil erosion.

## Safety and Security

It is acknowledged that, like other publicly accessible natural areas, the site presents a security surveillance and use control challenge. The Clackamas County Sheriff's Department and members of the Stakeholder Advisory Committee felt that an increase of public activity on the site will help discourage transient use and other abuses of the site. Neighboring residents and other trail users will help provide a heightened awareness of conditions in the area and will be able to alert the county sheriff's office or emergency response teams of hazard issues, violation of park rules or active abuse of the site. It is recommended that Metro and the City organize a community-based "Friends of Wilsonville Tract" group that will assist public agencies in this monitoring process.

## Interpretive and Educational Program

Public education and interpretation is an important component of the Wilsonville Tract project. Specialists in public education and interpretive planning should be brought into the project in order to capitalize on important issues and messages that will be of value to the public. Potential audiences of educational messages include local neighbors, recreationists, volunteers and students. Each group will benefit from different types and levels of educational and interpretive methods, such as signage, guided tours or hands-on

programs. An educational and interpretive program that includes signage should focus on the natural character and sensitive qualities of the site as well as cultural history. Topics to be researched and developed may include the following: geology, geography, soils, ecology, past logging and agricultural practices, cultural history and human settlement, ecological and wildlife habitats and restoration.

On the Concept Master Plan, several interpretive nodes have been identified along the trail system. Trailhead locations will include introductory interpretive materials. As the interpretive program is developed, additional sites that are more specific to individual topics will be identified. For example, information about waterfowl should be located at the most likely vantage point where birds may be observed. Durable, vandal-resistant signs with interesting graphics and brief narratives will educate the public, and increase awareness of this special natural resource.

## Public Use Restrictions

It was noted throughout the master planning process by members of the Stakeholder Advisory Committee, public open house participants, and the project team that the Wilsonville Tract possesses many attributes of a natural resource and wildlife preserve. Due to the fragile nature of the different evolving ecotypes and on-going restoration projects, human and domestic animal use restrictions were discussed. It is believed that the use restrictions are necessary to minimize human and domestic animal impacts on sensitive plant communities, wildlife and habitat, and to remain consistent with the intent of the Metro bond measure.

Use restrictions will be conveyed through interpretive messages to the degree necessary, so that rationale for restrictions is understood. Visitors will be informed through interpretive signage that restrictions are necessary to preserve and restore the site and help ensure public safety. The specifics of the restrictions are discussed in the following paragraphs

### Pedestrians

Trails have been planned to give access and allow people to experience the remarkable variety of landscape and ecological environments on this diverse site. Trails have been located to avoid fragmentation of the different habitat types. It is recognized that a "stay on the trail" policy helps to minimize human impacts to the surrounding natural resources. On a seasonal basis, pedestrians can further explore the oak savannah and open native prairies through paths that are simply cut through the tall grass. Natural areas undergoing restoration will be off-limits to pedestrian use.

### Bicycles

Bicycles will be restricted to the paved main north-south trail that connects Villebois to the schools and the Willamette River. Bicycles are not allowed on the proposed soft surface trails, since there is potential for erosion in areas with steep slopes and ruts in flatter soft surface trails. In addition, soft surface trails are too narrow to safely accommodate pedestrians and bicyclists using the trail at the same time.

### Dogs

Dogs will not be allowed on the Wilsonville Tract. The primary purpose of the Wilsonville Tract is to restore and protect its natural resources. Dogs, even on leashes, tend to mark the site as territory and because of their inherent predatory nature, will be a source of disturbance to both wildlife and vegetation.

### Equestrians

Due to the limited size of the tract, steep slopes, and narrow, low-impact trail widths, equestrian use of the tract is seen as incompatible with safe pedestrian usage of trails. Horses may also contribute to erosion in areas with steep slopes and damage soft surface trails. In short, the size and nature of the tract cannot adequately accommodate pedestrians, bikes, dogs and equestrians.

**Motorized Vehicles**
Motorized vehicles, (except motorized wheelchairs) will be prohibited, other than in a designated parking lot. The main trail and central loop trail will be designed to accommodate maintenance and emergency service vehicles.

**Smoking**
Smoking and fires of any size will be prohibited due to the need for fire prevention.

## Park Hours and Regulations Signage
For public security and safety, park hours signs and regulatory signs will be installed at each access point. A diagrammatic map of the park will assist visitors, emergency aid and police response teams with wayfinding. Additional regulatory signage may need to be placed in areas where unplanned and inappropriate pedestrian traffic or activities are encountered.

Regulatory signage will include restrictions on the following: dogs, bicycles, horses, fires, camping, motorized vehicles, digging, paintball, firearms, smoking, camping, shooting, hunting, intrusive noise, plant collecting and other activities or uses restricted by Metro's park rules.

## Cooperation with School Districts
Local school districts, in particular the West Linn/Wilsonville School District, are anticipated to be active supporters and users of the Wilsonville Tract site. The Tract contains many educational opportunities beneficial to local and regional students. The volume of regional educational use of the site will be monitored to ensure that the carrying capacity of the site is not exceeded. Ecological restoration projects and ecological restoration are recommended for hands-on field experience. Interpretive signage can be designed to enrich the field experience of students as well as inform the general public. Special programs coordinated between the CREST and the school district will enhance community involvement and the understanding of this regional community asset.

## ADA Accessibility
The Wilsonville Tract will include facilities that meet Americans with Disabilities Act (ADA) standards. Trailheads, access points, boardwalks, and connecting trails will conform to ADA standards according to the ADA Accessibility Guidelines for Outdoor Developed Areas, Play Areas and Recreational Facilities. In the forested portions of the site, U.S. Forest Service standards will apply.

## Toilet Facilities
Toilet facilities are to be provided in one location on the south side of the Tract, near the parking area at the entry off of Wilsonville Road. There are public restrooms at the CREST and facilities are planned for the Villebois greenway and/or the neighborhood commons to the north.

## Boardwalks and Bridges
Elevated boardwalks will be constructed where the paved main trail crosses the east side of the wetland areas adjacent to The Park at Merryfield neighborhood and the public park within The Park at Merryfield. Visual, not physical, access to the wetlands will be provided at these locations. The boardwalks will be designed and constructed to minimize impacts to wetland resources. One small foot bridge will be needed to cross Mill Creek in the forested area.

## Benches
Rustic wooden or recycled plastic lumber benches are proposed to be located throughout the Tract so that visitors will be comfortable while on site and enjoy the experience. Benches will generally be located at trailheads, secondary access points, interpretive nodes, overlooks and view points.

### Picnic Shelters, Trash Receptacles, Bike Racks and Drinking Fountains

A picnic shelter, trash receptacles, bike racks and a drinking fountain will be provided at the entry off of Wilsonville Road. An additional picnic shelter and trash receptacles will be located near Villebois at the north secondary access point. Picnic shelters could be used for environmental education programs on weekdays during the school year when the demand for picnicking is lowest. Trash receptacles will also be located at the school and CREST access points and at the main north trailhead. The remaining pedestrian access points will have a "pack-it-out" trash policy.

## Summary of Site Management Recommendations & Strategies

One of the most important overarching principles defined in the master plan process is to keep the Wilsonville Tract in a natural state as much as possible. The City, Metro and the Stakeholder Advisory Committee advised that improvements can be phased in over time. It was also emphasized that the areas of ecological recovery for wetlands, successional forest and oak savannah should be maintained in agricultural use until recovery efforts are initiated, since the site would be overrun by invasive plants if it were to lie fallow. It was felt if this premise was followed, the integrity and natural character of the site could be preserved for the longest period of time with the least amount of damage to the existing ecology. This approach promotes the development of a proactive management, maintenance and monitoring plan.

The Natural Resources Management Plan, Appendix A, provides important guidelines for development and restoration efforts. Field ecologists have spent invaluable research time collecting natural resource and habitat data for the maintenance and monitoring recommendations that specifically pertain to the Wilsonville Tract. By following these guidelines, impacts on one component of a sensitive ecological zone within the site will not impact other aspects of the system, including plant and wildlife habitats.

### General Monitoring and Maintenance

Monitoring is an often overlooked aspect of site management. Monitoring can be a very time consuming task that requires visual surveillance of site conditions on a regularly scheduled basis. Surveillance of large areas like the Wilsonville Tract is restricted by the size of the site and available public agency staff. Typically "Friends" groups provide a vital role in surveillance and maintenance of large sites. Dedicated community members organize and establish a sense of community ownership in natural areas and often are involved on a voluntary basis to monitor the site. These important tasks can be included as part of the CREST programs and carried out through the efforts of a proposed "Friends of Wilsonville Tract" group. Intimate familiarity with the site by volunteers will boost community support, an important aspect for the long-term success of the project.

For example, volunteer tasks may include trail and site condition monitoring. In seasons of active public use, it is critical for the safety and protection of the resource to monitor impacts to off-trail areas where short-cuts, defacto trails or improper use may develop. In less active seasons, typically winter months, it is important to inspect the site for damage such as flooding, landslides, soil erosion, drainage, fallen trees, trail failure and other hazards. These conditions will need to be repaired in preparation for public access in more active seasons.

Monitoring for hazards will also reveal appropriate timing for seasonal general maintenance of trails and removal of invasive, non-native species. A thorough, pro-active general maintenance regime will reduce the amount of hazards and troubleshooting required in off-season times.

## Trail Construction and Maintenance

Proper planning, design and construction techniques will help reduce the need for maintenance of the trail system over time. A summary of points for trail construction and maintenance are discussed in the following paragraphs:

### Trail Alignment

Trail grades, routing and endpoints need to be carefully considered before active trail construction begins. Given that the master plan outlines the general routes of the trails, the exact trail alignments will be designed with more detailed topographic maps and then field staked based on specific site conditions. Some additional trail building techniques and details are described in the referenced United States Forest Service material listed in the project resource list and included in Appendix E.

### Grading and Drainage

Most trail degradation is due to erosion and poor drainage. Trails should be well drained and maintenance practices should focus on controlling drainage on and off the trail. Water should not be allowed to puddle or travel across a trail. If a trail is eroded with water running across, it becomes further degraded by foot traffic trying to avoid muddy areas.

Trails should be graded with a cross-slope that tips slightly toward the downhill side of a slope. This will help keep storm water from concentrating and increasing in velocity and erosive power. At locations where natural concentration of storm water crosses a trail, a culvert or other control device should be used to reduce the velocity, control its route and help reduce impacts.

### Drainage

Culverts, water bars, ditches and other types of drainage devices used should be routinely inspected, cleaned or adjusted to maximize their effectiveness. Mapping of culvert locations is suggested since culverts often become obscured from casual view.

Mayer/Reed

Wilsonville Tract conifer forest

## Vegetation Management

### Native Plants

One of the project goals is to preserve and protect the sensitive and native plant species and the intrinsic environment they create. By their nature, native plants that are adapted and established to the proper location are hardy in this climate and sustain themselves. Competing invasive species, if left unchecked, can diminish the optimum habitat required to have a healthy native plant eco-system.

In addition to invasive species, there are many other potential impacts to native plants such as compaction of soils by pedestrian foot traffic, bicycle use, domestic animals and off-trail explorations.


Mayer/Reed

Forest floor with invasive species

A formal comprehensive inventory of native and naturalized plants has been completed as part of the Natural Resources Management Plan document developed by the project team. See Appendix A for a comprehensive list of these plants and their associated plant communities.

**Resource Protection Areas**

There are a number of native species found throughout the site that are especially sensitive to foot traffic. Larger areas should be left unsigned. Public trails should not lead to areas identified as highly sensitive. A location should be chosen where concentrations are sufficient for adequate interpretation and visitor education.

**Invasive Species Control**

Invasive species occurring on the Wilsonville Tract property include Himalayan blackberry and English ivy in the upland forest and reed canarygrass in wetland areas. English holly is present in scattered locations in the Mill Creek forest and thistles are present in many parts of the site. English hawthorn grows throughout the uplands adjacent to wetlands. Butterfly bush is also gaining a place on the Tract property. Other invasive plants are identified in the Natural Resources Management Plan, Appendix A.

Common sense and an understanding of the growth cycles of invasive species (non-native) plants and native species is paramount to controlling invasive species. Eradication of invasive species is a process that requires training, guidance, patience and commitment.

Damage to native species is an unavoidable reality during hand removal of unwanted plants, but sensitive planning and scheduling of removal activities will greatly reduce the degree of impact sustained. Short-term damage is acceptable in view of the fact that if left unchecked, the invasive species may overtake the natives and continue to degrade the site's ecology.

Areas adjacent to trails are especially subject to repeated disturbance from foot and bicycle traffic. Even minor disturbances provide for propagation of opportunistic invasive seeds. Construction of new trails can, at times, involve clearing of canopy trees. Removal of the forest canopy allows light to penetrate to the forest floor and provides a new microclimate environment for seeds of invasive plants to propagate. Trails can also interrupt natural drainage patterns, creating new wet pockets that provide favorable conditions for invasive species.

In the process of scheduling plant removal activities, it is generally best to remove invasive species along trails last. This sequence will

allow replanting of disturbed trailside areas with native species at the same time.

Timing and methods of removal are specific to each invasive species. Removal guidelines referenced in the Natural Resources Management Plan should be followed to avoid impacts to the natural ecology.

**Goats as Invasive Species Control**

Ivy and other invasive species have become a widespread problem in forested areas around the region. Many communities are experimenting with alternative methods of removal and maintenance. On the Wilsonville Tract, Metro has begun a program of using domestic goats for invasive vegetation control.

In the fall of 2002, a herd of approximately 700 goats were fenced and allowed to graze approximately two acres of the forest containing English Holly and English Ivy. Goats are indiscriminate in what they will eat, which led to desirable vegetation being eaten along with invasive species. However, the native species on the test site were dormant by the time of the grazing and returned the next spring.

Grazing generally does not eliminate the weeds, rather it disrupts the ivy enough for follow up treatment. While the ivy is growing back, it is possible to use goats as a potential control method in combination with continued hand pulling and selective herbicide treatment.

**Use of Herbicides**

Some studies on invasive species removal methods and practices indicate that hand removal is the most effective long term solution to total eradication. There are varying views on methods of removal of invasive species including selective use of herbicides. Herbicides should always be used with extreme caution. An experienced ecologist or botanist and a licensed applicator should review products and methods, approve and carry out any proposed herbicide use. When integrated with other pest management techniques, selective use of herbicides can be an important tool in restoring natural systems.

**Work Forces**

Volunteer work forces have been effective in helping to control invasive plant species. Community groups, social clubs, scouts and youth organizations are examples of volunteer resources. However, proper training in removal techniques is paramount. Volunteer group leaders should be trained prior to the day of removal activities by experienced public agency staff and/or other trained volunteers.

Mayer/Reed

Forest floor

## Recommended Next Steps

Developing the Wilsonville Tract into a more publicly accessible natural area is an important purpose of the master plan. A preliminary phasing of improvements is outlined in this report to provide Metro and the City with a guide for the most effective phasing, timing for improvements and funding opportunities. It is expected that improvements will be implemented in phases as funding allows.

### Implementation Costs

Design, construction and development costs are estimated in today's dollars. However, specific site conditions, materials costs and labor expenses fluctuate greatly with the economy and regional construction markets. For more detailed information, reference Preliminary Estimate of Implementation Costs, Appendix F.

### Establishing Volunteer Groups

Community volunteer groups will play an important role in implementing the goals of the master plan. Volunteer groups promote community use of the site and help establish a community's sense of stewardship. With appropriate funding, Metro and the City can facilitate the establishment of a "Friends of Wilsonville Tract" organization to help focus the efforts. Monitoring the site for abuse, violation of use restrictions, trail conditions and hazards are some examples where volunteers are especially effective. Volunteer groups can also be trained in methods to help eradicate invasive species. Establishing a "Friends of Wilsonville Tract" is an important first step in establishing community support for the master plan.


Wilsonville Tract central portion

### First Priority: Legacy Creek

Legacy Creek is the most adversely impacted stream channel within the Wilsonville Tract. It has received out-of-basin stormwater flows since the 1950s when the Dammasch State Hospital was developed. The increased flow has caused extensive head cutting and bank failures throughout the channel. To prevent further degradation, remedial work must commence immediately. This project must be closely coordinated with watershed planning of the Villebois development.

The rehabilitation of Legacy Creek should include addressing the out-of-basin transfer and arresting the head cuts that currently migrate through the channel. Metro is a local sponsor for a US Army Corp of Engineers (USACE) Section 206 Aquatic Ecosystem Restoration project on the Wilsonville Tract. A study will be necessary to determine the feasibility of restoring wetland, riparian and upland habitats. The project would restore the natural drainage system to Arrowhead Creek and reduce channel instability and downcutting in Legacy Creek. For more technical information, refer to Site Restoration, Appendix A.

## Partnerships and Funding for Implementation

Metro and the City of Wilsonville will approach a variety of funding opportunities for future capital improvements and restoration activities. These resources include, but are not limited to the following:

- Land and Water Conservation Fund Grants
- National Fish & Wildlife Foundation (NFWF)
- Federal Highway Administration's Transportation Efficiency Act for the 21st Century (TEA-21) program
- United States Fish and Wildlife Service (USFWS)
- US Army Corps of Engineers Section 206 Grants
- Oregon State Parks and Recreation
- State Transportation Improvement Program (ODOT)
- Oregon Department of Forestry
- Recreational Trails Program Grants
- Measure 66 Funds, Local Goverment Grant Program
- Clackamas County Capital Improvement Program (CIP)
- Metropolitan Transportation Improvement Program
- Metro Greenspaces Program
- Local funding from systems development charges
- Community Development Block Grants
- Ducks Unlimited
- Private and Corporate donations
- Oregon Watershed Enhancement Board

A listing of tasks, phasing and implementation strategies follow this section.

## Plan Implementation and Phasing

| Description | Phase One<br>Early Opportunities | Phase Two<br>Mid-Range Opportunities | Phase Three<br>Long-Range Opportunities |
|---|---|---|---|
| **Organization & Administration** | 1 Assess labor force requirements.<br>**METRO/CITY** | 1 Assess labor force requirements annually.<br>**METRO/CITY** | 1 Continue efforts.<br>**METRO/CITY** |
| | 2 Continue to foster support of volunteer groups.<br>**METRO/CITY** | 2 Facilitate the establishment of a "Friends of Wilsonville Tract" community action group.<br>**CITY/METRO** | 2 Continue efforts.<br>**METRO/CITY** |
| | 3 Develop an intergovernmental agency agreement.<br>**METRO/CITY** | 3 None, assuming phase one efforts are completed. | 3 None |
| **Funding** | 1 Explore and develop funding opportunities and project partnerships.<br>**METRO/CITY** | 1 Pursue funding from identified sources for outlined projects.<br>**METRO/CITY** | 1 Continue to seek funding for on-going management.<br>**METRO/CITY** |
| **Planning** | 1 Jointly develop a timeline and work tasks for permitting, survey work and coordination on related projects.<br>**METRO/CITY** | 1 Update timeline and work tasks.<br>**METRO/CITY** | 1 Update timeline and work tasks.<br>**METRO/CITY** |
| | 2 Review master plan with all potential permitting agencies to establish future permitting requirements.<br>**CITY/METRO** | 2 Initiate permitting for any improvements pending.<br>**METRO/CITY** | 2 Provide required monitoring of permitted activities.<br>**METRO** |

## Plan Implementation and Phasing

| Description | Phase One<br>Early Opportunities | Phase Two<br>Mid-Range Opportunities | Phase Three<br>Long-Range Opportunities |
|---|---|---|---|
| **Planning (cont.)** | 3 None in this phase. | 3 Complete topographic survey of all access points to assess trail construction feasibility. Begin monitoring.<br>**METRO** | 3 Organize trail enhancement, initiate required permitting for construction of new trails. Monitor trail conditions.<br>**METRO** |
| | 4 None in this phase. | 4 Coordinate permitting for entry development at parking lot with Clackamas County.<br>**CITY/METRO** | 4 None, assuming initial phase efforts are completed. |
| | 5 Coordinate trail connections with Villebois development.<br>**CITY** | 5 Continue efforts and monitoring.<br>**METRO** | 5 Continue monitoring.<br>**METRO** |
| | 6 Complete Tonquin Trail Feasibility Study.<br>**METRO** | 6 Completed. | 6 Completed. |
| | 7 Anticipate future evaluation of site program.<br>**METRO/CITY** | 7 Re-evaluate site program and assess conditions of site. **METRO/CITY** | 7 Re-evaluate site program and assess conditions of site.<br>**METRO/CITY** |
| | 8 None in this phase. | 8 Prepare a comprehensive long term maintenance plan.<br>**METRO** | 8 Update plan as required.<br>**METRO** |
| | 9 None in this phase. | 9 Conduct soils/drainage study to avoid impacts to heighboring properties.<br>**METRO/CITY** | 9 Update plan as required.<br>**METRO** |

## Plan Implementation and Phasing

| Description | Phase One<br>Early Opportunities | Phase Two<br>Mid-Range Opportunities | Phase Three<br>Long-Range Opportunities |
|---|---|---|---|
| **Inventory Assessment/Site Preparation/ Ecological Restoration/Site & Ecological Monitoring** | 1 Assess stream bank stabilization opportunities, storm water handling, drainage patterns and ecological and restoration opportunities. Begin mitigation implementation. **CITY/METRO** | 1 Implement identified opportunities. Begin monitoring. Maintain improvements. **METRO** | 1 Continue to monitor and maintain improvements. **METRO** |
| | 2 Establish wetland delineations for all wetlands identified in this report. **METRO** | 2 Assess and begin ecological restoration and wetland enhancement opportunities. **METRO** | 2 Continue efforts. **METRO** |
| | 3 Identify planting buffer needs along east property boundary. Begin implementing buffer plantings. **METRO/CITY** | 3 Maintain plantings. **METRO** | 3 Maintain plantings. **METRO** |
| | 4 Begin monitoring of existing forest and begin invasive species removal. **METRO/CITY** | 4 Monitor and manage species removal. **METRO/CITY** | 4 Assess and begin ecological restoration and enhancement opportunities of successional forest revegetation. Continue invasive species monitoring and management. **METRO/CITY** |
| | 5 Continue agricultural practices using recommendations identified in the Natural Resources Management Plan. **METRO** | 5 Discontinue agricultural practices. Assess and begin ecological restoration and enhancement opportunities of oak savannah and native open prairies. **METRO** | 5 Maintain oak savannah and native open prairies. **METRO** |

## Plan Implementation and Phasing

| Description | | Phase One<br>Early Opportunities | | Phase Two<br>Mid-Range Opportunities | | Phase Three<br>Long-Range Opportunities |
|---|---|---|---|---|---|---|
| **Inventory Assessment/Site Preparation/ Ecological Restoration/Site & Ecological Monitoring (cont.)** | 6 | Establish ecological monitoring program.<br>**METRO** | 6 | Monitor annually every fall.<br>**METRO** | 6 | Monitor annually.<br>**METRO** |
| | 7 | Initiate a formal wildlife inventory to provide base for impact assessment and management. Begin routine monitoring.<br>**METRO** | 7 | Monitor impacts to restored and enhanced areas.<br>**METRO** | 7 | Continue efforts.<br>**METRO** |
| | 8 | None in this phase. | 8 | Monitor impacts from informal use of site and phase one activities.<br>**METRO/CITY** | 8 | Monitor impacts from site development and use.<br>**METRO/CITY** |
| | 9 | Research USDA Natural Resources Conservation Service records for documentation of agricultural drain tile system.<br>**METRO** | 9 | Continue efforts. | 9 | Continue efforts. |
| **Design/ Construction** | 1 | Coordinate water diversion efforts of Legacy Creek outfall with Villebois. Relieve Legacy Creek from wash-outs. HIGHEST PRIORITY.<br>**CITY/METRO** | 1 | Design and construct streambank restoration.<br>**METRO/CITY** | 1 | Continue efforts.<br>**METRO/CITY** |
| | 2 | Complete design plans & implement construction of CREST gateway & restrooms. HIGH PRIORITY.<br>**CITY** | 2 | None, assuming phase one efforts are completed. | 2 | None, assuming phase two efforts are completed. |

## Plan Implementation and Phasing

| Description | | Phase One<br>Early Opportunities | | Phase Two<br>Mid-Range Opportunities | | Phase Three<br>Long-Range Opportunities |
|---|---|---|---|---|---|---|
| **Design/ Construction (cont.)** | 3 | None in this phase. | 3 | Hire design consultant team to provide survey information and conceptual designs for all points of entry.<br>**METRO** | 3 | Complete development of the Primary and Middle School, the Park at Merryfield public land, Living Enrichment Center and Villebois access points and the North and South trailheads.<br>**METRO** |
| | 4 | None in this phase. | 4 | Finalize plans for trail alignments.<br>**METRO** | 4 | Complete development of the north/south paved trail with boardwalks, CREST connector trail, and soft surface trail to intersection of Indian Plum and Mill Creeks for educational research. Begin and complete development of remaining trails.<br>**METRO** |
| | 5 | None in this phase | 5 | Finalize plans for site improvement elements.<br>**METRO** | 5 | Complete development of the site improvements.<br>**METRO** |
| | 6 | None in this phase | 6 | Solicit volunteer community groups for trail enhancement, construction and maintenance tasks.<br>**METRO** | 6 | Continue efforts.<br>**METRO** |
| | 7 | Finalize design plans for site regulatory signage.<br>**METRO** | 7 | Complete development and installation of regulatory signage.<br>**METRO** | 7 | None, assuming phase two efforts are completed. |

## Plan Implementation and Phasing

| Description | Phase One<br>Early Opportunities | Phase Two<br>Mid-Range Opportunities | Phase Three<br>Long-Range Opportunities |
|---|---|---|---|
| **Education/ Interpretation** | 1 Solicit involvement of school districts and CREST to define environmental education opportunities.<br>**CITY/METRO** | 1 Design and implement interpretive signage plan. Involve school district and CREST.<br>**METRO/CITY** | 1 None, assuming phase two efforts are completed. |
| | 2 Add a program of nest boxes for birds. Coordinate installation through CREST.<br>**CITY/METRO** | 2 Continue efforts.<br>**CITY/METRO** | 2 Continue efforts.<br>**CITY/METRO** |
| **Site Maintenance** | 1 METRO to continue to maintain site in stable condition.<br>**METRO** | 1 Train additional staff as needed to address demands of site.<br>**METRO** | 1 Continue site maintenance.<br>**METRO** |
| | 2 Train volunteers to remove invasive plant species and establish removal routine.<br>**METRO** | 2 Continue invasive species removal routine.<br>**METRO** | 2 Continue invasive species removal routine.<br>**METRO** |
| | 3 None in this phase. | 3 Solicit community groups for trail enhancement and maintenance tasks.<br>**CITY/METRO** | 3 Continue efforts.<br>**CITY/METRO** |
| **Safety/Security** | 1 Assess future need for fire hydrants at entrances.<br>**CITY/METRO** | 1 Plan for and coordinate installation of fire hydrants at two main public points of access, as required.<br>**METRO/CITY** | 1 If needed, complete fire hydrant installation.<br>**METRO/CITY** |
| | 2 Continue dialogue and review of plans with public fire and safety personnel.<br>**METRO/CITY** | 2 Annually review site development with appropriate public agencies.<br>**METRO/CITY** | 2 Continue efforts.<br>**METRO/CITY** |

# Conclusion

The Wilsonville Tract Master Plan, along with the recommendations of the Natural Resources Management Plan, describe the resolution and commitment of the city, Metro and the community to protect this area as a natural and public resource.

Upon approval by the Metro Council, Clackamas County Board of County Commissioners, West Linn/Wilsonville School Board, the City of Wilsonville Planning Commission and Wilsonville City Council, this plan will be a guiding force for the next 10 to 15 years.

The City of Wilsonville and Mayer/Reed would like to thank all the individuals who recognize the remarkable potential of the site and have participated in this important planning effort for the Wilsonville Tract.  It is our hope that the energy and enthusiasm of this effort will continue toward implementation of the plan in the future and that the Wilsonville Tract becomes a model for how to recover the natural ecological systems of the land, provide public education and create a balance for passive recreational use by visitors.

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Natural Resources Management Plan

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# Introduction

## Study Area

The 230-acre Wilsonville Tract is located in Oregon's Willamette Valley, about fi mile north of the Willamette River. The site features open fields with gentle rolling terrain, well-defined riparian corridors, wetlands, coniferous forests, mixed deciduous woodlands and a managed filbert orchard. A lone Oregon white oak stands in the middle of the open space serving as a focal point for the site. The open areas of the site provide excellent views of Mt. Hood and the forested Cascade Range to the east.

## Natural History

The Wilsonville Tract inherits much of its geologic character from large-scale events that shaped the Willamette Valley throughout the ages. The Willamette Valley lies between the Cascade Range to the east and the Coast Range to the west. Deep soils, gentle topography and occasional earthquakes characterize the valley. The northern part of the valley contains extensive sheets of basalt that spread into the valley and Wilsonville about 16 million years ago through a broad saddle in the Cascade Range. The basalt sheets, part of the Columbia River Basalt Group, are about 300 feet thick near Wilsonville.

During the last ice age, 17,000 to 12,000 years ago, a series of catastrophic floods from glacial Lake Missoula inundated the Willamette Valley with water as deep as 200 feet. The ice-age floods carried in sediment from the Columbia River and ice-rafted large boulders from as far away as Montana. Due to a constriction along the Columbia River below Portland, floodwater backed up into the Willamette Valley, reaching as far south as Eugene. Huge icebergs carrying larger boulders and cobbles were stranded along the edges of this temporary lake. Within a few days, the floodwaters drained back out to the north.

This inundation and draining happened at least forty times in the Willamette Valley. These floods left behind characteristic silt soils and large glacial erratics around the valley.

The floodwaters in the Willamette Valley mostly followed the course of the Willamette River. As the water deepened in the Portland basin, some of the water overtopped a broad low point or saddle in the hills around Portland and cascaded to the west as a gigantic cataract. Its footprint is now occupied by Lake Oswego.

These diverted waters flowed southeast, carving many channels in the basalt divide between Sherwood and Tualatin north of Wilsonville, an area known as the Tonquin Scablands. These floodwaters then rushed south to the main floodway west of present-day Interstate 5 at Wilsonville. This area was a delta of sorts, deposited by the waters that came through Lake Oswego and south through the Tonquin Scablands.

During the peak floods, the Wilsonville Tract site was covered with water deeper than 200 feet. The Wilsonville Tract is just west of the main flow of water that tracked through the Tonquin Scablands and that formed the Wilsonville delta. It is likely that the material deep under the site is mostly sand deposited by eddies forming off of the main flow through the Tonquin Scabland area during the largest floods. Additionally, fine sand and silt was deposited on the site during the period when temporary lakes filled the Willamette Valley.

Glaciations, volcanic eruptions, earthquakes and even cataclysmic floods have created large-scale disturbances in the region at various

times. However, an abundance of refuge and migration corridors have contributed to the resilience of species diversity. Coastal rainforests have existed in the northwest for nearly 2 million years. Evergreen conifers dominate the forested landscape of the region. Their dominance is based primarily on the favorable intersection of mild temperatures and abundant precipitation. Conifers gather sunlight and grow all year long and are well adapted to drought conditions in the summer months, which gives them an advantage.

Today, the Wilsonville Tract supports a variety of northwest native plant communities. The site contains an interesting matrix of upland and wetland herbaceous, shrub, woodland and forested community types.

Many of these community types have been significantly impacted by both human and natural causes. Impacts stem from agricultural and forestry practices over the past 150 years coupled with the influx of non-native species. Non-native species on the site are, in many cases, invasive and are compromising the ecologic diversity, habitat value, hydrologic stability and aesthetic value of the site. Impacts such as agriculture and forestry have left the habitat severely fragmented and the diversity of plant community types are in varied stages of ecological succession. In conjunction with the varied plant communities found on the site, there is an abundance of wildlife species.

## Cultural Resources

The State Historic Preservation Office (SHPO) was contacted to determine whether any historic or archaeological resources are known to be present in the project vicinity. SHPO does not have any records of prior archeological surveys being conducted in Township 3 South, Range 1 West, Section 15 and there are no listings on the National Register of Historic Places for this area. Due to the proximity of the site to the former Dammasch State Hospital and the long agricultural settlement history along the Seely Ditch corridor, a pedestrian transect survey on the site could be used to determine the potential for archaeological resources on the site.

## Native Indian History

The native people who lived in the Willamette Valley were called the Kalapuyans. They lived in this area for up to 10,000 years before the arrival of European Americans in the early 19th century. The Kalapuyans were not a single tribe, but rather a loose classification of many independent bands that had similar languages and lifestyles. The Kalapuyan people have been broken down into groups to distinguish between the regions in which they lived. Some of the groups were the Tualatin, Champoeg, Chafan, and Long Tom. At the peak of their civilization, the Kalapuyans numbered about 10,000 to 20,000 inhabitants.

More than a dozen Kalapuya tribes lived in the heart of the fertile Willamette Valley between the Coast Range Mountains and the Cascade Mountains. Their territories stretched from the winter villages of the Tualatin (present day Forest Grove), Hillsboro and Beaverton; to the Yonkalla, who lived just northeast of Roseburg in the Calapooia Mountains. As semi-nomadic peoples, the Kalapuya lived in permanent winter homes and migrated throughout the Willamette Valley during the warmer months. They traded regularly with their Molalla and Cayuse neighbors as well as other Northern California, Oregon coast and Columbia River tribes.

The Ahantchuyuk (sometimes called the Pudding River or French Prairie Indians) held territory from just north of present-day Salem, across French Prairie to the upper Willamette Falls and along the Pudding and lower Molalla Rivers. Indians above the Willamette Falls were called the Wil-lamt, and those below the falls were called the Multnomah (who were Upper Chinooks, not Kalapuyans).

The Atfilati Kalapuya centered around the rich food supply at Wapato Lake on the Tualatin Plains and seasonally migrated to Oswego Lake for the abundance of roots, fish and waterfowl, and to the Willamette Falls for salmon. Also called the Tualatin Indians, the Atfilati people occupied about 24 villages on the Tualatin Plains and River, the hills around Forest Grove, the north fork of the Yamhill River and the vicinity of present-day Portland.

The last native speaker of the language was John Hudson, a Santiam Kalapuya, who once lived on the Grand Ronde Reservation and was interviewed in 1928. He was once translated as saying:

> "Only a man went hunting, he hunted all the time.... Women always used to dig camas and they gathered tarweed seeds. They gathered acorns, they picked hazelnuts, they picked berries, they dried blackberries. When they burned the land, they burned the grasshoppers. And the women gathered up the grasshoppers and they ate those grasshoppers...."

By the turn of the century, the Tualatin (Wapato Lake), Yamhill, Ahantchuyuk (Pudding River), Luckiamute, Santiam, Mary's River Band (Chepenafa), Chemapho (Maddy Band), Tsankupi, Tsanchifin (McKenzie), Mohawk River, Chelemela (Long Tom River), Winnefelly and Yonkalla (Umpqua Kalapuya) were all tribes who spoke one of three variations of the softer sounding Kalapuyan language.

It is reported that they slash burned to make the countryside an open pasture to make the habitat more conducive to elk, deer, camas, tarweed and hazelnuts. This rare pre-agricultural land management ensured that lush meadows would attract game and produce traditional plant foods every spring. It is also reported that the freshly burnt fields left camas seeds loosened from their pods and ready for harvest. The women would go out into the fields and use seed fan (baskets) to beat the seeds from the parched pods. Like camas, staple foods such as tarweed, wapato, hazelnuts and acorns were harvested by women, cooked, sometimes ground then pressed into cakes and often stored for the lean winter months to come.

Like other Willamette Valley tribes, the Kalapuya also relied on hunting for food, clothing and tools. In addition to hunting wildcat with bow and arrow, Kalapuya tribes used snares to trap small game, pitfalls to catch elk, as well as spears and lures to fish for salmon, steelhead trout and eels.

Between 1830 and 1833, a malaria plague swept through the Willamette Valley leaving behind only a fraction of the original Kalapuya population. Tensions grew between Willamette Valley Indians and white settlers in the mid-1800s; it was not long before the Kalapuya would join the ranks of other treaty-signing tribes: Chiefs and headmen of the Winnefelly, Mohawk River, Chapen, Tecopa, Santiam, Chepenafa (Mary's River) and Ahntchuyuk tribes and bands of Kalapuya signed the Dayton Treaty in 1855 (the New Deal). The remaining Kalapuya, estimated around 240, were moved to a reservation at Grand Ronde. Today there are about 2,000 people of Kalapuyan descent alive. The Kalapuya peoples are part of the Confederated Tribes of Grand Ronde.

# Site Conditions

## Wilsonville Tract Soil Types

The Soil Survey of Clackamas County indicates that the study area contains seven soil types. Each soil type is related to a specific range of slope and historic vegetation (typical of areas not in cultivation) as noted below. Soil types and their placement on the site naturally direct what type of vegetation is appropriate for restoration purposes.

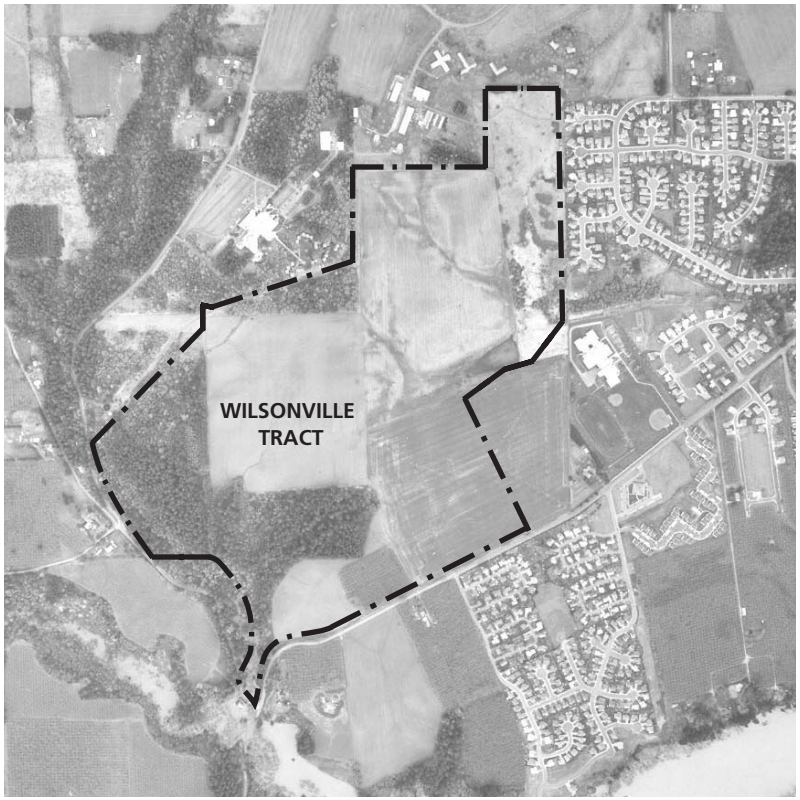
| Unit | Name & Class | % slope | Typical Vegetation |
|---|---|---|---|
| 1A, B | Aloha silt loam<br>Aquic Xerochrepts | 0-3, 3-6% | Douglas fir, Oregon white oak, snowberry, rose, tall Oregon grape, grasses and forbs |
| 3 | Amity silt loam<br>Argiaquic Xeric Argialbolls | <3% | Douglas fir, Oregon white oak, wild rose, willow, and grasses |
| 29 | Dayton silt loam<br>Typic Albaqualfs | <3% | Oregon ash, hawthorn, rose, and native grasses |
| 84 | Wapato silty clay loam<br>Fluvaquentic Haplaquolls | <3% | Oregon ash, red alder, black cottonwood, willow, western red cedar, rose, rushes, sedges, and grasses |
| 86A, B, C | Willamette silt loam<br>Pachic Ultic Argixerolls | 0-3, 3-8, 8-15% | Douglas fir, Oregon white oak, western hazel (native filberts), blackberry, and grasses |
| 91B, C | Woodburn silt loam<br>Aquultic Argixerolls | 0-3, 3-8% | native grasses, western hazel, poison oak, Douglas fir, and Oregon white oak |
| 92F | Xerochrepts and Haploxerolls, | very steep | Douglas fir, Oregon white oak, bigleaf maple, western red cedar, red alder, western hazel, Oregon grape, and salal |

Dayton and Wapato soils are hydric (wetland) soils, and Aloha, Amity, and Woodburn soils may have hydric inclusions (pockets of wetland soils scattered throughout the soil type) of Dayton or Huberly soils. Willamette soils may have wet spots and Xerochrepts and Haploxerolls may have seeps. Two "stony spots" are mapped in or near the forest edge south of Legacy Creek and in or near the filbert orchard [Appendix A, Figure 1]. The Soil Survey has more information on the development and nature of these soils (USDA SCS 1985).

## Floodplain Elevations

Floodplain elevations have not been determined on the site along Mill Creek. Corral Creek, south of Wilsonville Road, has a 100-year floodplain elevation of 92 feet. No floodplain is mapped along the Arrowhead Creek drainage, although occasional localized flooding has resulted from high water levels in Arrowhead Creek backing up the storm sewer system due to an undersized culvert.

The 1996 flood event resulted in little surface ponding on the site, except for the small agricultural wetland area dominated by reed canarygrass. The drainages in the agricultural field are readily visible on the 1996 flood photographs and provide a blueprint for wetland/stream restoration in the agricultural fields.




Provided by: City of Wilsonville

Wilsonville Tract

## Hydrology

Hydrology is the science of how water flows to and from a specific area of land. It accounts for precipitation, contributions to and from groundwater, evaporative conditions and runoff that develops into site inflows and outflows. Typically, hydrology examines the effect of a hypothetical storm that delivers a fixed volume of water to the site over a specific period of time, often 24 hours. Hydrologists ask: How does the landscape react? How much water does the ground absorb? How much water is stored in ground surface depressions? How much water manifests as surface (or piped) flows to and from the site? Thorough analysis should consider the influence of vegetation on how the landscape reacts, the timing of peak flows and the effects of evaporation.

The most prominent aspect of hydrology is run-off. How much surface flow results from a specific storm? Considering the landscape as a series of many small channels that combine to form larger and larger channels, one begins to appreciate the effect that timing has on hydrology. If flow is sped up in the smallest channels the larger receiving channel must convey more water since all the small channels are delivering a similar volume of water in a shorter period of time. This progression continues as receiving channels become larger and larger.

## Current and Historic Hydrological Conditions and Stormwater Flow Patterns

Changes to the landscape inevitably alter the landscape's hydrologic response. Historic conditions in the Willamette Valley typically consisted of forest with a thick organic duff layer over the soil and interspersed wetlands. The historic conditions provided ample opportunity for water to be stored within the landscape and slowly


Fishman Environmental Services, LLC

## Wilsonville Tract Soil Types

| | |
|---|---|
| 1A,B | Aloha silt loam<br>Aquic Xerochrepts |
| 3 | Amity silt loam<br>Argiaquic Xeric Argialbolls |
| 29 | Dayton silt loam<br>Typic Albaqualfs |
| 84 | Wapato silty clay loam<br>Fluvaquentic Haplaquolls |
| 86A,B,C | Willamette silt loam<br>Pachic Ultic Argixerolls |
| 91B,C | Woodburn silt loam<br>Aquultic Argixerolls |
| 92F | Xerochrepts and<br>Haploxerolls |

Figure 1. Wilsonville Tract Soils Analysis

released. Conversion to agriculture generally included removal of forest vegetation and duff layer, draining of wetlands and grading soils to shed water. Typically conversion to agriculture reduces water storage on the landscape, and thus reduces contributions to groundwater and evaporative losses and increases run-off. Conversion to urban use carries these changes a step further by adding impervious areas to the landscape that only shed and do not absorb water, such as rooftops and roads. With urbanization, there is an increase in stormwater runoff and traditionally an increased emphasis on conveying stormwater off a particular site. Traditional stormwater engineering schemes rely on an elaborate system of pipes to convey water quickly off-site. The traditional approaches to stormwater have increased flows in our receiving streams and rivers resulting in erosion and degraded habitat conditions.

The Wilsonville Tract, although a portion is still relatively pristine, has not been unaffected by altered hydrology resulting from changes on the landscape and traditional approaches to dealing with stormwater. Conversion to agricultural use included installation of drain tile and filling in the headwaters of Arrowhead, Legacy, Indian Plum and Pristine Creeks. Additionally, piped stormwater flows have been delivered out-of-basin to Legacy Creek from the Dammasch State Hospital since the 1950s, which has caused severe erosion due to the increased volume of water.

[1]Strahler, A.N. (1952). "Hypometric (Area-Altitude) Analysis of Erosional Topography," Bull. Geol. Soc. Am., 63, 1117-42.

[2]Rosgen, D.L. (1994): A Classification of Natural Rivers. Catena, Vol 22: 169-199. Elsevier Science, B.V. Amsterdam.

## Existing Stream Channel Conditions

### Mill Creek

The reach of Mill Creek that flows on site is a fourth order[1] channel, and is an E6 or F6[2] channel according to Rosgen's classification depending upon the entrenchment ratio, which requires surveying and potentially hydraulic modeling to determine.

The Mill Creek channel displays a relatively homogenous character through the Wilsonville Tract. Homogenous channels are characterized by displaying a typical channel type that does not change significantly through the reach. Vegetative communities and stream channel characteristics suggest a post-logging disturbance regime. The channel's bottom width is approximately 10 feet and top width approximately 30 feet, and it appears to be incised into the floodplain approximately 6 feet. The channel meanders through a floodplain that is approximately 70 to 100 feet wide. Remnants of large logs, exhumed by flow within the channel, were observed in the channel bed.

The historic condition of the Mill Creek floodplain was likely a cedar swamp with multiple braided channels. The apparent channel incision is likely a response from logging impacts and transformation of the watershed from a primarily forested condition to agricultural use. Transformation of the Mill Creek watershed is expected to continue as portions of the basin become more urbanized. It appears that much of the channel incision that could occur has occurred within Mill Creek. It is possible that some further incision could take place if runoff and stream discharge increases with urbanization. Profile survey data and hydraulic analysis would determine this potential. It is more likely the channel will laterally expand following urbanization. This will take place through bank failure and erosion and be directly related to any increase in channel forming or bankfill discharge caused by an increase in run-off from

additional roads and housing development. The channel form is currently stable and has adjusted to logging disturbances and changes in hydrology (run-off) created by agricultural land clearing. An increase in run-off and discharge from future development would create another cycle of instability and adjustment.

Currently, the channel is incised and the ability of high flow to access the former valley bottom floodplain appears to be limited. Hydrologic and hydraulic analysis would indicate the degree of incision. An appropriate long-term approach to prevent any future incision in Mill Creek may include extensive placements of large woody debris in the channel. Large woody debris could help slow flows and serve to reconnect the floodplain.

**Legacy Creek**

Legacy Creek, a tributary to Mill Creek, is the most adversely impacted stream channel within the Wilsonville Tract. Legacy Creek is a second order channel below the confluence of two first order channels in its upper drainage. Legacy Creek is classified as a Rosgen A6 Channel. It has received out-of-basin stormwater flows since the 1950s, with the development of the Dammasch State Hospital, the site of the future Villebois development. These flows from the Dammasch property are not just an increased run-off response within the Legacy Creek basin; they are piped from outside the historic watershed. Thus, adding Dammasch stormwater has effectively added to the area contributing flow to Legacy Creek. The increased flow coupled with the incision of Mill Creek has caused extensive head cutting and bank failures throughout the channel. The streambed is primarily comprised of clay with limited quantities of cobble observed upstream of an existing trail crossing.

Head cutting refers to the vertical face in the streambed, analogous to a waterfall that tends to migrate in the upstream direction. This form of erosion is caused by water pouring over the vertical face causing intense turbulence and energy transfer on the vertical face. The energy transfer tends to suspend soils at the vertical face and flow carries these suspended soils downstream. The result is that the channel bed drops after a head cut has migrated through. As the channel bed drops, an unstable face is created along the sides of the channel at the toe of the channel banks and the channel banks become undermined. The unstable face at the toe of the channel banks creates the potential for slides and rotational failure of side slopes.

A 4-foot high head cut was observed approximately 550 feet upstream of the confluence with Mill Creek and another 4-foot high head cut was observed approximately 650 feet upstream of the confluence with Mill Creek. The farthest upstream head cut is located within close proximity (approximately 40 feet downstream) of an existing trail crossing Legacy Creek. Stream bank or valley side slope failures were observed for almost the entire channel length below these head cuts. The formerly V-shaped valley has been transformed to a U-shape in lower Legacy Creek. The slope failures have impacted vegetative conditions as large trees have toppled and steep slopes remain as bare soils. Streambed substrate in this lower reach is primarily clay.

A series of smaller head cuts (approximately six, with an average height of two feet) were observed upstream of the existing trail crossing. However, side slopes were not as severely impacted as the lower reach and some cobble was observed in the channel. A channel fork is located at the upstream end of the channel near the forest edge. It appears that the channels have been filled upstream of the fork. Large boulders appear to have been placed to stabilize approximately 15-foot drops in the channels located near the confluence of these forks. The southern-most fork originates at the edge of the open field and the forest has an eroded gully and exposed drain tile. Historic aerial photography and topographic data suggests that the upper reaches of Legacy Creek located in the open field were filled and converted to agricultural use. The

only evidence of an outfall structure that was observed was water pouring out of the streambank. The water pouring out of the streambank could have been from the diversion, a spring or a drain tile. The outlet pipe may have been hidden by large rocks, blackberry shrub or broken off within the streambank.

Upland, forested areas adjacent to Legacy Creek have retained much of their historic vegetative character. However, the stream channel and adjacent side slopes have been impacted by increased flows. Large woody debris jams and cobble streambed sediments were likely present in the historic stream channel and subsequently washed out with increased flows. This has an effect on water quality since flows through cobble sediments filter water, tend to be cooler and provide buffering to reduce fluctuations in pH. Therefore, water quality has likely been degraded from sediment input resulting from erosion and the out-of-basin transfer.

A major problem on this site is erosion. Stormwater from the Dammasch site to the north is currently piped to the top of Legacy Creek, causing erosion in the streambed below the outfall and there are at least two areas of slumping. Out-of-basin stormwater should not be discharged to Legacy Creek. If no other alternatives exist, stormwater should not be discharged to the stream without treatment and detention. The two areas of slumping are located below the trail crossing of Legacy Creek; the stability of these areas should be evaluated by an engineer and protected from future slumping as necessary. Since most of the old growth trees on the site are growing on the steep slopes adjacent to streams, it is important to act immediately.

**Indian Plum Creek**

Indian Plum Creek is a first order channel that is classified as a Rosgen A6 Channel. A slight channel incision, approximately one foot deep, was observed in Indian Plum Creek. Other than the slight channel incision, Indian Plum Creek appeared to be in good condition through the forested reaches. Channel and floodplain conditions appeared to be in relative accordance with historic conditions below the open field. Future efforts should provide measures to preserve the character of forested reaches of Indian Plum Creek. Historic aerial photography and topographic data suggest that the upper reaches of Indian Plum Creek were filled and converted to agricultural use. Restoring the headwaters of Indian Plum Creek will provide improved habitat and water quality. Providing a more complex edge between the open field and forest will enhance wildlife habitat, and establishing a mildly sloped vegetative buffer between open field and stream will improve water quality.

**Pristine Creek**

Pristine Creek is a first order channel above the open field and becomes a second order channel near the edge of the Mill Creek forest. Pristine Creek is classified as a Rosgen A6 Channel. Channel and floodplain conditions appeared to be in relative accordance with historic conditions except in the open field that separates the triangle forest from the lower forested reaches. The reach through the open field has been filled and converted to agricultural use. Restoration of the filled portion of Pristine Creek is strongly recommended, as it will link habitats of the triangle forest and the lower forested reaches of Pristine Creek.

**Arrowhead Creek**

Arrowhead Creek drains the northern and eastern portions of the Wilsonville Tract. Natural wetlands located near the eastern boundary of the property and adjacent to Boones Ferry Primary and Wood Middle Schools are part of the Arrowhead Creek drainage. Historic aerial photography and topographic data suggests that the upper reaches of Arrowhead Creek, above the natural wetlands, were filled and converted to agricultural use. Furthermore, analysis of topographic data suggests that the Dammasch State Hospital site's stormwater was historically conveyed to the Arrowhead Creek

and Coffee Lake Creek watersheds. Arrowhead Creek consists of first and second order channels upstream of the wetland complex. It is a third order channel below the wetland complex. Arrowhead Creek is a Rosgen E Channel within the wetland area.

## Fish/Aquatic Habitat

Mill Creek (a tributary to Corral Creek) and a few tributaries (Legacy Creek and, as named in this document, Indian Plum Creek and Pristine Creek) are contained within a large mixed coniferous-deciduous forest located northeast of the intersection of Wilsonville and Bell Roads. Stream surveys of Mill Creek and Legacy Creek were conducted in June, 2001 as part of the Tonquin Geologic Area Natural Resource Inventory for Metro (Fishman Environmental Services, LLC 2002). Mill Creek was sampled upstream of the tributary streams. Mill Creek has a lower gradient (estimated to be less than 2 percent) and a more open valley form than Legacy Creek. Steep sided bank walls of erodable soils are common and the dominant substrates are silt and sand. The water level was quite low at the time of survey and the water temperature measured 16 degrees C (61 degrees F). Wetted width averaged six feet with an average riffle depth of four inches and an average pool depth of 1.5 feet.

Legacy Creek was sampled approximately 75 feet downstream of the existing trail crossing. Legacy Creek has a steep 5 to 10 percent gradient with occasional 2 to 3-foot vertical steps in a constrained valley form. Substrates consisted of cobbles, large gravel, boulders and fines. Two streamside slumps, or small landslides, were observed below the trail crossing. Average wetted width was four feet and depth in riffles averaged three inches. Riffle habitat areas were larger than pools. Pools varied in depth from 0.5 to 2 feet. Water temperature was 13 degrees C (55 degrees F).

Large woody debris is present in both Mill Creek and Legacy Creek and the creeks are shaded by a well-developed riparian canopy. Mill Creek supports native cutthroat trout, red-side shiner and sculpin, which require cool temperatures to survive. No fish were observed in Legacy Creek. Native crayfish and stream snails were frequently observed in both streams. Other observed macro-invertebrates included mayfly, large saddle-backed cased caddisfly, water strider, black fly, midge, scud and aquatic earthworm.

Arrowhead Creek (a tributary to Coffee Lake Creek) flows approximately one mile to Coffee Lake Creek through relatively flat lands, except for the central portion, which is located in a steep ravine. The headwaters area is in an agricultural field west of an Oregon ash forested wetland area north of Inza R. Wood Middle School. The creek has been ditched and channelized with scattered Oregon ash trees present and is approximately five feet wide. A pedestrian trail is present north of the school. The creek is culverted under the pedestrian trail and under Wilsonville Road. It then flows through the Oregon ash and Douglas fir forest, a box culvert and through a bigleaf maple, Douglas fir, Oregon ash and western red cedar forest. The final 200 feet of stream is culverted before joining Coffee Lake Creek (Seely Ditch). Land use along Arrowhead Creek is residential in the northern portion and industrial in the southern portion. Overall, fish habitat is degraded. No sampling data are available for Arrowhead Creek.

## Existing Volunteer Trails

Existing trails within the Mill Creek Forest are shown on the Site Opportunities and Constraints Map, page 33.

# Site Vegetation

## Historic Vegetation Communities (1850s Land Survey)

The Surveyor General's Office surveyed the Wilsonville area in 1852 and recorded general notes on vegetation present at the time. Mill Creek and Corral Creek are shown on the 1852 survey map and the Wilsonville Tract is mapped as having undergrowth of fern, hazel and willow (1852 Historic Survey, Page 26) obtained by Mayer/Reed from The Corps of Engineers. Farther to the northwest, the land is "rolling and gently rolling" with "timber fir and oak openings." "Oak openings" is a term for oak savannah used in the central states.

The Coffee Lake area to the northeast of the Wilsonville Tract is mapped as a "Black Swamp" with willow, alder, hardhack (Douglas spirea) and white ash. The upland island, a remnant of the Missoula floods, is present in the center of the swamp (as it is today). Drainage is mapped south of the swamp, draining into the Willamette River. An "Indian Trail" crosses the drainage approximately ⁄-mile south of the swamp. Land to the east of the Black Swamp is mapped with "timber fir, yellow pine, white oak, undergrowth fern, hazel, willow and sallal (salal)".

Metro has further refined the historic vegetation surveys into land cover maps that show the western portion of the Wilsonville Tract as upland closed forest, with the remainder of the site mapped as oak savannah.

## Plants of the Wilsonville Tract

Vegetation of the Wilsonville Tract is shown below, by common and scientific name, wetland indicator status (e.g. OBL, FAC), native (N) versus introduced (I) and invasive or noxious status. Following this list, the plant communities of the Wilsonville Tract are described. The Wetland Indicator status includes:

| | |
|---|---|
| OBL | Obligate Wetland (almost always occur in wetlands) |
| FACW | Facultative Wetland (usually occur in wetlands) |
| FAC | Facultative (equally likely to occur in wetlands or non-wetlands) |
| FACU | Facultative Upland (usually occur in non-wetlands) |
| UPL, NOL | Upland, Not Listed (almost always occur in non-wetlands) |
| NI | No Indicator (insufficient information available or plant is widely tolerant) |

Invasive species have been defined by the Clean Water Services (formerly USA) Design and Construction Standards for Sanitary Sewer and Surface Water Management, February 2000. Noxious species are defined by the Oregon Department of Agriculture (http://www.oda.state.or.us/Plant/Weed_control/NoxWeedQuar.html)

## Trees

Bigleaf Maple, Acer macrophyllum, FACU red alder, Alnus rubra, FAC, N
Oregon ash, Fraxinus latifolia, FACW, N
Black Cottonwood, Populus trichocarpa [P. balsamifera ssp. trichocarpa], FAC, N
Douglas fir, Pseudotsuga menziesii, FACU, N
Oregon white oak, Quercus garryana, UPL, N
Scouler willow, Salix scouleriana, FAC, N
Western Red Cedar, Thuja plicata, FAC, N

## Shrubs and Young Trees

Vine Maple, Acer circinatum, FAC-, N
Red Alder, Alnus rubra, FAC, N
Saskatoon Serviceberry, Amelanchier alnifolia, FACU, N
Dull Oregon Grape, Berberis nervosa, UPL, N
Western Flowering Dogwood, Cornus nuttalli, UPL, N
Red-osier Dogwood, Cornus stolonifera [C. sericea], FACW, N
Beaked Hazelnut, Corylus cornuta, FACU, N
Black Hawthorn, Crataegus douglasii, FAC, N Tree
Ornamental Hawthorn, Crataegus monogyna, FACU+, N
Western Wahoo, Euonymus occidentalis, UPL, N
Oregon Ash, Fraxinus latifolia, FACW, N
Salal, Gaultheria shallon, FACU, N
Ocean Spray, Holodiscus discolor, UPL, N
English Holly, Ilex aquifolium, UPL, I
Indian Plum, Oemleria cerasiformis, FACU, N
Black Cottonwood, Populus trichocarpa [P. balsamifera ssp. trichocarpa], FAC, N
Sweet cherry, Prunus avium, UPL, western crabapple, Pyrus fusca [Malus fusca], FACW, N
Poison Oak, Rhus diversiloba [Toxicodendron quercifolia], FACU, N
Baldhip Rose, Rosa gymnocarpa, FACU, N
Nootka Rose, Rosa nutkana, FAC, N
Clustered Wild Rose, Rosa pisocarpa, FAC, N
Himalayan Blackberry, Rubus discolor, FACU, noxious
Evergreen Blackberry, Rubus laciniatus, FACU+, I
Thimbleberry, Rubus parviflorus, FAC-, N
Salmonberry, Rubus spectabilis, FAC+, N
Pacific Willow, Salix lasiandra [S. lucida var. lasiandra], FACW+, N
Piper's Willow, Salix piperi, FACW, N
Scouler Willow, Salix scouleriana, FAC, N
Sitka Willow, Salix sitchensis, FACW, N
Red Elderberry, Sambucus racemosa, FACU, N
Snowberry, Symphoricarpos albus, FACU, N
Western Red Cedar, Thuja plicata, FAC, N
Red Huckleberry, Vaccinium parvifolium, UPL, N

## Herbs

Bugbane, Actaea rubra, UPL, N
Pathfinder, Adenocaulon bicolor, UPL, N
Northern Maidenhair Fern, Adiantum pedatum [A. aleuticum], FAC, N
Quack Grass, Agropyron repens [Elytrigia repens], FAC-, noxious
Bluebunch Wheatgrass, Agropyron spicatum, UPL, N
Bentgrass, Agrostis speciessilver hairgrass, Aira caryophyllea, UPL, I
Water Foxtail, Alopecurus geniculatus, OBL, N,
Meadow Foxtail, Alopecurus pratensis, FACW, N
Mayweed Chamomile, Anthemis cotula, FACU, I
Sweet Vernalgrass, Anthoxanthum odoratum, FACU, I
Lady Fern, Athyrium filix-femina, FAC, N
California Brome, Bromus carinatus, UPL, N
Soft Cheat grass, Bromus mollis, UPL, I
Common Shepherd's Purse, Capsella bursa-pastoris, FACU, I
Slenderbeaked Sedge, Carex athrostachya, FACW, N
Dense Sedge, Carex densa, OBL, N
Dewey's Sedge, Carex deweyana, FACU, N
Henderson's Sedge, Carex hendersonii, FAC, N
Hare's-foot [broom] sedge, Carex leporina [C. ovalis], FACW, N

Slough Sedge, Carex obnupta, OBL, N
Thick-headed sedge, Carex pachystachya, FAC, N
Pointed Broom Sedge, Carex scoparia, FACW, N
Foothill sedge, Carex tumulicola, FACU, N
Fox sedge, Carex vulpinoidea, OBL, Nchaffweed, Centunculus Minimus, FACW, N
Rnchanter's Nightshade, Circaea alpina, FAC+, N
Canada Thistle, Cirsium arvense, FACU+, noxious
Bull Thistle, Cirsium vulgare, FACU, noxious
Field Morning-glory, Convolvulus arvensis, UPL, noxious
Smooth Hawksbeard, Crepis capillaris, FACU, I
Orchard Grass, Dactylis glomerata, FACU, I
Fairy-bell, Disporum species, FACU, N
Large Barnyard Grass, Echinochloa crusgalli, FACW,
N Creeping Spikerush, Eleocharis palustris, OBL, N
Willow-herb, Epilobium speciesWatson's willow-herb, Epilobium Watsonii [E. ciliatum], FACW-, N
Common Horsetail, Equisetum arvense, FAC, N
Common Scouring-rush, Equisetum hyemale, FACW, N
Tall Fescue, Festuca arundinacea, FAC-, I
Crinkle Lawn Fescue, Festuca subuliflora, UPL, N
Catchweed Bedstraw, Galium aparine, FACU, N
Oregon Avens, Geum macrophyllum, FACW+, N
Ground Ivy, Glecoma hederacea, FACU+, I
Mannagrass, Glyceria species, FACW+, N
English Ivy, Hedera helix, UPL, invasive
Common Velvetgrass, Holcus lanatus, FAC, I
Pacific Waterleaf, Hydrophyllum tenuipes, UPL, N
Toad Rush, Juncus bufonius, FACW, N
Soft Rush, Juncus effusus, FACW, N
Pointed Rush, Juncus oxymeris, FACW+, N
Spreading Rush, Juncus patens, FACW, N
Slender Rush, Juncus tenuis, FACW-, N
Wild Lettuce Species, Lactuca speciesred dead-nettle, Lamium Purpureum, UPL, I
Hairy Hawkbit, Leontodon nudicaulis, UPL, I
Italian Ryegrass, Lolium multiflorum, UPL, I
Perennial Ryegrass, Lolium perenne, FACU, I
Skunk Cabbage, Lysichitum americanum, OBL, N
Creeping Jenny, Lysimachia nummularia, FACW, I
Hyssop Loosestrife, Lythrum hyssopifolia, OBL, N
Tarweed, Madia species, FACU+/UPL
Siberian Springbeauty, Montia sibirica, FAC, N
Yellow & Bblue forget-me-not, Myosotis discolor, FACW, I
Mountain Sweet-cicely, Osmorhiza chilensis, UPL, N
Yellow Parentucellia, Parentucellia viscosa, FAC-, I
Reed Canarygrass, Phalaris arundinacea, FACW, invasive
Timothy, Phleum pratense, FAC-, I
Scouler's Popcorn-flower, Plagiobothrys scouleri, FACW, N
Cutleaf Plantain, Plantago coronopus, FACW, I
English Plantain, Plantago lanceolata, FAC, I
Kentucky Bluegrass, Poa pratensis, FAC, I
Roughstalk Bluegrass, Poa trivialis, FACW, I
Willow smartweed, Polygonum lapathifolium, FACW, I
Spotted Ladysthumb, Polygonum persicaria, FACW, I
Knotweed or smartweed (long white immature flowers), Polygonum species
Licorice Fern, Polypodium glycyrrhiza, UPL, N
Sword Fern, Polystichum munitum, FACU, N
Black Cottonwood, Populus trichocarpa [P. balsamifera ssp. trichocarpa], FAC, N
Clover, possibly red clover, Trifolium pratense, FACU, I
Self-heal, Prunella vulgaris, FACU+, unknown(species includes both a native and a non-native variety(provide a footnote)
Bracken Fern, Pteridium aquilinum, FACU, N
Creeping Buttercup, Ranunculus repens, FACW, I
Buttercup, Ranunculus specieswild radish, Raphanus sativus, NI, I
Curve-pod Yellow-cress, Rorippa curvisiliqua, OBL, N

Pacific Blackberry, Rubus ursinus, FACU, N
Sheep Sorrel, Rumex acetosella, FACU+, I
Tansy Ragwort, Senecio jacobaea, FACU, noxious
Common Groundsel, Senecio vulgaris, FACU, I
Feather False Solomon's Seal, Smilacina racemosa, FAC-, N
Prickly Sow-thistle, Sonchus asper, FAC-, I
Mexican Hedgenettle, Stachys mexicana [S. ciliata, S. emersonii], FACW, N
Chickweed, Stellaria media, FACU, I
Fringecup, Tellima grandiflora, UPL, N
Foam Flower, Tiarella trifoliata, FAC-, N
Piggy-back Plant, Tolmiea menziesii, FAC, N
Western Starflower, Trientalis latifolia, FAC-, N
Western Trillium, Trillium ovatum, FACU, N
Stinging Nettle, Urtica dioica, FAC+, N
White Inside-out Flower, Vancouveria hexandra, UPL, N
American Speedwell, Veronica americana, OBL, N
Purslane Speedwell, Veronica peregrina, OBL, N
Bird Vetch, Vicia cracca, UPL, I
Common Vetch, Vicia sativa, UPL, I
Slender Vetch, Vicia tetrasperma, UPL, I
Hairy Vetch, Vicia villosa, UPL, I
Stream Violet, Viola glabella, FACW+, N

Plant taxonomy follows Hitchcock and Cronquist (1973) and synonymy follows Reed (1988); synonymy as well as updated taxonomic changes (Kartesz 1994) are shown in [single square brackets].

Indicator Status from Reed, P.B., Jr. 1988. National List of Plant Species that Occur in Wetlands: Northwest (Region 9). U.S. Fish and Wildlife Service Biological Report No. 88 (26.9) and Reed, P.B., Jr., et al. 1993. Supplement to List of Plant Species That Occur in Wetlands: Northwest (Region 9).

Native (N) / Introduced (I) as per Flora of the Pacific Northwest by Hitchcock & Cronquist (ibid)

Invasive as per Clean Water Services (formerly USA) Design and Construction Standards for Sanitary Sewer and Surface Water Management, February 2000.

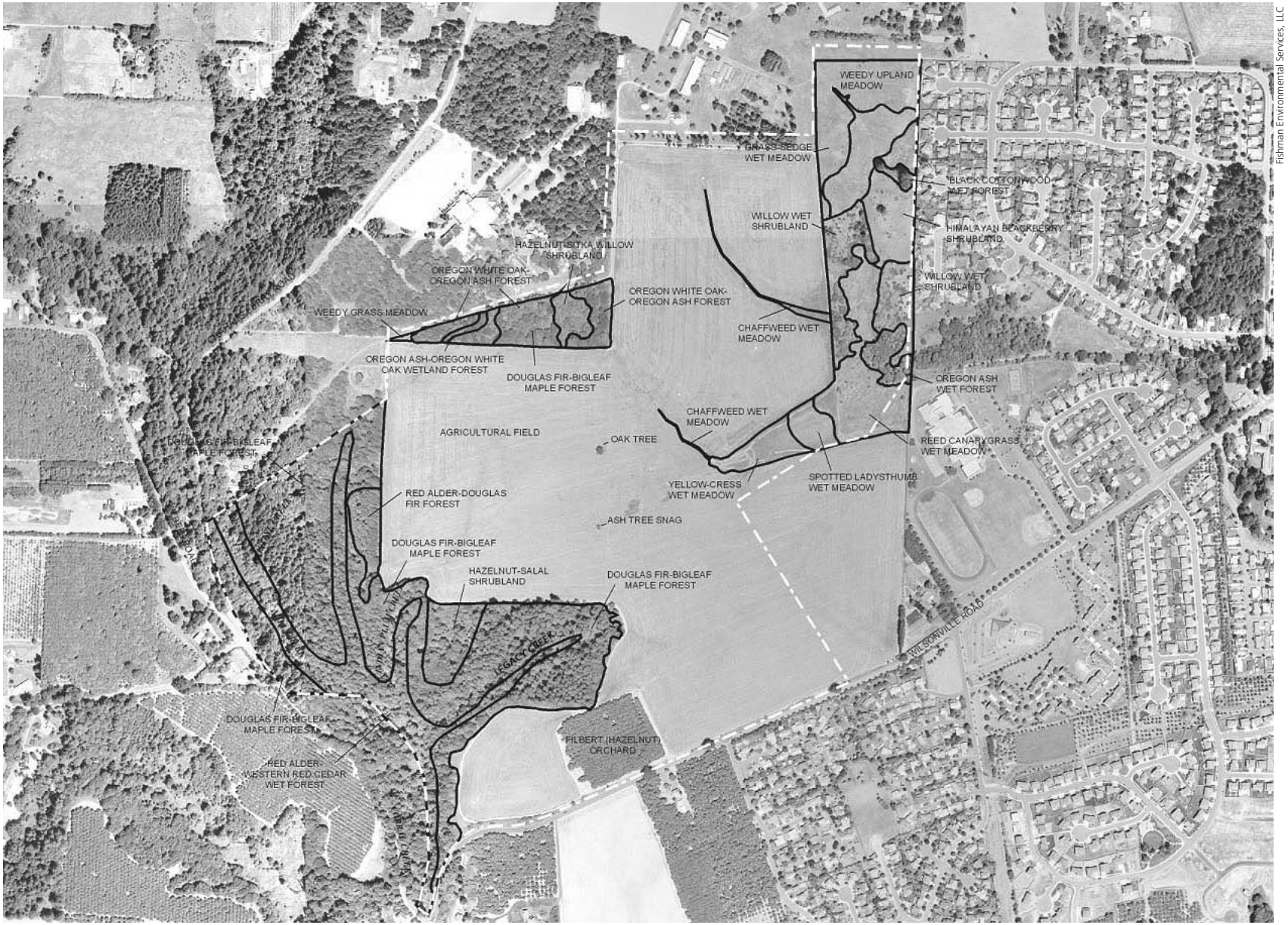
Noxious as per Oregon Department of Agriculture:
(http://www.oda.state.or.us/Plant/Weed_control/NoxWeedQuar.html)



## Current Plant Communities

Plant communities were mapped on the site using the National Vegetation Classification System (Anderson et al. 1998, Grossman et al. 1998) to define plant communities. A plant association is defined as a plant community with a definite floristic composition and uniform habitat condition that repeats itself across the landscape. Plant associations were identified by the current expression of floral species composition. Each plant association was described by the dominant plant species (25% cover) in each vegetative layer (e.g. tree canopy, shrub, groundcover). Species lists were compiled for each plant association. In addition to the perennial ryegrass agricultural field and filbert (hazelnut) orchard, the following plant community types were identified on the Wilsonville Tract and are mapped in Figure 2, Appendix A. The Indian Plum Creek and Pristine Creek plant communities are included in the Mill Creek community descriptions.

*Cowardin Classification: PFO is palustrine forested (woody vegetation 20 feet or taller), PSS is palustrine scrub-shrub (woody species up to 20 feet tall), PEM is palustrine emergent (non-woody species including herbs, forbs, grasses, rushes, sedges, ferns, etc.). No POW, or palustrine open water wetlands (areas which contain ponded water for the majority of the growing season, as shown in a summer aerial photographs, with a water depth typically too deep to support emergent wetland vegetation but which may support floating aquatic vegetation or submerged vegetation in shallower areas such as perimeters of ditched streams and ponds) were found on the site.




Fishman Environmental Services, LLC

Figure 2 Wilsonville Tract Vegetation Communities

## Table of Plant Community Types

| Code | Plant Community Type | Area and Dominant Plant Species |
|---|---|---|
| FDU | forest, deciduous, upland | Triangle Forest (Oregon white oak - Oregon ash / Pacific blackberry) |
| FMU | forest, mixed, upland | Mill Creek Forest (Two types: Douglas fir - bigleaf maple/ English ivy - Pacific waterleaf - sword fern; and red alder - Douglas fir / beaked hazelnut), Triangle Forest (Douglas fir - bigleaf maple / beaked hazelnut / English ivy - Pacific blackberry) |
| FDW | forest, deciduous, wetland (PFO*) | Triangle Forest (Oregon ash - Oregon white oak / clustered wild rose - western crabapple / reed canarygrass), Arrowhead Creek (two types: Oregon ash / water foxtail - reed canarygrass; and black cottonwood / reed canarygrass) |
| FMW | forest, mixed, wetland (PFO*) | Mill Creek Forest (red alder - western red cedar / vine maple / lady fern - reed canarygrass - piggyback plant - stinging nettle) |
| SU | shrub, upland | Mill Creek Forest (beaked hazelnut - salal / English ivy), Triangle Forest (beaked hazelnut - Sitka willow / sword fern), Arrowhead Creek (Himalayan blackberry) |
| SW | shrub, wetland (PSS*) | Arrowhead Creek (Pacific willow - Piper's willow - Scouler willow) |
| HU | herbaceous, upland | Triangle Forest (weedy grass meadow), Arrowhead Creek (sweet vernalgrass - Canada thistle - tall fescue - English plantain) |
| HW | herbaceous, wetland (PEM*) | Arrowhead Creek (5 types: curve-pod yellow-cress; spotted ladysthumb; reed canarygrass; chaffweed; and meadow foxtail - common velvetgrass - diverse sedge) |

## Vegetation

Vegetation associations were determined after walking the plant communities on the site to document vegetation species composition and structure, and review of aerial photographs. Plant associations were typically defined by two to three dominant species in each layer. A plant community (for example, mixed upland forest) can contain several plant associations (for example, Douglas fir - bigleaf maple and red alder - Douglas fir). Plant associations were mapped by hand on aerial photographs (Spencer B. Gross, Inc. July, 2000; Scale: 1 inch = 100 feet & 200 feet) and then digitized into ArcView / GIS. Changes in forest associations were difficult to map on aerial photographs where canopy cover obscured changes in understory vegetation.

For the Mill Creek area, a 1952 historical aerial photograph was reviewed to assist with mapping and understanding vegetation cover history (in 1952 a portion of the forest was cleared and another area appeared to be a filbert orchard. Currently the filbert orchard is over-topped with red alder and the other area is a dense shrub thicket). In addition to using historical aerial photographs, a GPS unit was used to locate trails and streams in the Mill Creek forest. The GPS technician recorded points at regular intervals along trails. Several known locations (observable on the aerial photograph) were also recorded as ground control for CAD overlay and to check GPS accuracy. The manufacturer's specification for this unit advertises 1 to 3 meters for accuracy; however, GPS data often yields 95% precisions ranging from 0.27 to 0.47 meters (0.9 to 1.5 feet). Where satellite coverage was poor and the GPS could not yield suitable results. Bearing, slope and distance were calculated to complement potentially poor data points. Once these features were mapped on the aerials, it facilitated mapping plant associations. The GPS points were differentially corrected with base station data from the Kelso, Washington base station files and exported to ESRI shapefiles. The shape-files were overlaid on an ortho-rectified aerial photograph provided by Metro.

See Site Opportunities and Constraints Map for existing old growth stands, page 33.

## Mill Creek Plant Communities

### Mill Creek Mixed Upland Forest Community (FMU1)

Douglas fir, Pseudotsuga menziesii - bigleaf maple, Acer macrophyllum/English ivy, Hedera helix - Pacific waterleaf, Hydrophyllum tenuipes - sword fern, Polystichum munitum

FMU1: This mixed upland forest dominates the site. It is a late successional Douglas fir forest with fir over-topping bigleaf maple. Douglas fir ranges in size from 11-inches up to 73-inches diameter at breast height (dbh). The largest trees (>60 inches dbh) are located at the top of the hillslope adjacent to Legacy Creek and on the west side of Mill Creek. Bigleaf maple ranges in diameter from 11 to 17 inches dbh. Because of the dense tree canopy, the shrub canopy is less developed, except along the streams. There are pockets of hazelnut and dull Oregon grape; other shrubs are scattered. English ivy dominates the understory and has spread throughout much of the forest and is climbing numerous trees; work parties have removed vines from many trunks, but it will take a significant effort to remove ivy from the forest. Five 100-meter linear transects were evaluated for English ivy cover. English ivy cover was assessed every 10 meters along the tape. The beginning point was randomly selected. At each 10-meter interval, every leaf or stem that was intersected by a vertical transect was counted and recorded reflecting the density of ivy and its presence or absence along the transect. Photographs were taken at the beginning and end of each transect sighting down the transect. Himalayan blackberry is dominant on the field edge of the forest. A fence

surrounding the forest was removed in the fall of 2001; its removal should make it easier to control the blackberry. There are many snags and large woody debris is common throughout the site.

### Mill Creek Mixed Upland Forest Community (FMU2)

Red alder, Alnus rubra - Douglas fir, Pseudotsuga menziesii / beaked hazelnut, Corylus cornuta

FMU2: The mixed upland forest community is an early successional red alder/Douglas fir forest that has overgrown a filbert orchard; the orchard was evident in a 1952 aerial photograph of the site. The shrub layer is dominated by beaked hazelnut. The Douglas fir was planted in a line on the edge of the agricultural field.

### Perennial Mill Creek & Tributaries and Seasonally Flooded Mixed Forest Community (FMW1)

Red alder, Alnus rubra - western red cedar, Thuja plicata / vine maple, Acer circinatum /lady fern, Athyrium filix-femina - reed canarygrass, Phalaris arundinacea - piggyback plant, Tolmiea menziesii, stinging nettle, Urtica dioica

FMW1: Mill Creek and its tributaries are perennial streams with well-developed western red cedar and red alder canopies with vine maple in the understory. The steep slopes of the tributaries are dominated by vine maple, red elderberry and sword fern. Mill Creek has a broad floodplain that contains reed canarygrass and Himalayan blackberry, whereas the tributaries do not. Legacy Creek, the southernmost tributary, is approximately five feet wide; the creek and wetland fringe are about 21 feet wide and the width of the riparian community fluctuates between 75 and 125 feet with very steep hillslopes. Legacy Creek has received excessive piped run-off that has caused erosion and hillslope slumping; run-off will have to be better controlled in order to protect the steep hillslopes of this tributary. The middle tributary (Indian Plum Creek) contains less water and the channel is approximately one foot wide and the riparian community about 100 feet wide. The northernmost tributary (Pristine Creek) channel is one to two feet wide and the stream meanders through a 50 to 75 foot wide riparian zone.

### Mill Creek Upland Shrub Community (SU1)

Beaked hazelnut, Corylus cornuta - salal, Gaultheria shallon / English ivy, Hedera helix

SU1: The mixed upland shrub community is a dense thicket dominated by beaked hazelnut and salal with ivy in the herb layer. In reviewing a 1952 aerial photograph of the site, this portion of the site lacked trees.

## Triangle Forest Plant Communities

### Triangle Forest Deciduous Upland Forest (FDU1)

Oregon white oak, Quercus garryana - Oregon ash, Fraxinus latifolia/Pacific blackberry, Rubus ursinus

FDU1: This community borders the wetland forest associated with the tributary to Pristine Creek on the east and west. The tree canopy is dominated by Oregon white oak and Oregon ash. A few scattered Douglas fir are present at the north edge of this community along the dirt road. A diverse shrub layer is present. Invasive species are present in a few areas near the road and could easily be removed. The herb layer is generally sparse with Pacific blackberry dominant and a few hydrophytic (hydrophytic vegetation is macrophytic plant life growing in water or on a substrate that is, at least, periodically deficient in oxygen as a result of excessive water content, i.e. water tolerant plants) species present adjacent to the wetland boundary.

### Triangle Forest Mixed Upland Forest (FMU1)

Douglas fir, Pseudotsuga menziesii - bigleaf maple, Acer macrophyllum/beaked hazelnut, Corylus cornuta / English ivy, Hedera helix - Pacific blackberry, Rubus ursinus

FMU1: This community contains a mixed coniferous/deciduous tree canopy dominated by Douglas fir and bigleaf maple. A few black cottonwood and Norway spruce are present at the north edge of this community along the dirt road. English ivy has heavily invaded the north edge of the forest and forms a thick groundcover extending approximately 100 feet into the forest and is also present on many trees. The shrub layer is generally open in the English ivy-dominated area; however, it becomes more developed in the interior part of the forest, where it is dominated by beaked hazelnut. Pacific blackberry is the dominant groundcover in areas where English ivy is not present.

### Triangle Forest Seasonally Flooded Deciduous Wet Forest (FDW1)

Oregon ash, Fraxinus latifolia - Oregon white oak, Quercus garryana/clustered wild rose, Rosa pisocarpa - western crabapple, Pyrus [Malus] fusca /reed canarygrass, Phalaris arundinacea

FDW1: This forested wetland community is associated with Pristine Creek that flows south from the Living Enrichment Center property through the Triangle Forest, and then is piped under the agricultural field to the south. The tree canopy consists of Oregon ash and Oregon white oak. The shrub layer is dominated by clustered wild rose and western crabapple. The herbaceous layer consists of nearly 100% cover of reed canarygrass. Himalayan blackberry, evergreen blackberry and field morning-glory are present in the disturbed area near the road.

### Triangle Forest Shrub Upland (SU1)

Beaked hazelnut, Corylus cornuta - Sitka willow, Salix sitchensis/sword fern, Polystichum munitum

SU1: This community consists of an opening in the otherwise dense tree canopy on the site. A dense shrub layer is present and is dominated by beaked hazelnut and Sitka willow. Approximately 15% tree cover is present and consists of scattered Douglas fir. Sword fern is dominant in the herb layer.

HU1: (Weedy Grass Meadow) A small amount of herbaceous upland is present in the westernmost corner of the site west of the Triangle Forest and consists of predominantly non-native grasses and weedy upland species. Species were not recorded in the field.

## Arrowhead Creek Plant Communities

### Arrowhead Creek Plant Communities

The Arrowhead Creek Unit is located north of Wilsonville Road and north and west of Inza R. Wood Middle School. The site is comprised of an agricultural field wetland west of the school and a mix of forested, scrub-shrub and emergent wetlands with upland fringes north of the school. The agricultural wetland presents excellent enhancement opportunities (and potentially wetland creation as well). The large wetland complex with upland fringes located north of Inza R. Wood Middle School is located immediately adjacent to an area the school has been managing. A recreational trail is also present in this area. The reed canarygrass is very dense, thick and tall (up to 6 feet), and walking through the area is difficult. There are three points of access: at the northeast corner from just north of the fence along the Park at Merryfield development; from the west agricultural field near a large ornamental hawthorn tree; and from the south through the wetland forest just north of the school. The area in the north end has been mowed and there are piles of Himalayan blackberry debris.

### Arrowhead Creek Agricultural Wetland Seasonally Flooded Herbaceous Community (HW1)

Curve-pod yellow-cress - Rorippa curvisiliqua

HW1: This agricultural wetland community forms part of the headwaters of Arrowhead Creek, just north and west of the Inza R. Wood Middle School and Boones Ferry School. It has historically been farmed and is surrounded by perennial ryegrass (in 2001). The agricultural wetland consists of four emergent plant communities, from west to east (drier to wetter): curve-pod yellow-cress (HW1), which appears yellow (both on the ground and in the aerial photograph); spotted ladysthumb, which appears red (HW2), and reed canarygrass, which appears green or white (HW3); the wetland also has two fingers extending north into the field, dominated by chaffweed (HW4). Farther north, in a non-agricultural area, a diverse sedge - grass meadow is present.

### Arrowhead Creek Agricultural Wetland Central Seasonally Flooded Herbaceous Community (HW2)

Spotted ladysthumb, Polygonum persicaria

HW2: This central portion of the agricultural wetland is dominated by spotted ladysthumb.

### Arrowhead Creek Agricultural Wetland East, Central Portion And Northeast Herbaceous Saturated Wetland Herbaceous Community (HW3)

Reed canarygrass, Phalaris arundinacea

HW3: This reed canarygrass community has been plowed in the west and extends east into a non-managed field with a few scattered black cottonwood trees and shrubs. It forms the core central meadow area of the Arrowhead Creek headwaters area and is very difficult to walk due to the height and density of the reed canarygrass. It is surrounded on the west and east by willow shrub (SW1) and Oregon ash forest (FDW1). A second area of reed canarygrass meadow is present in the northeast portion of the site, west of the Park at Merryfield housing development.

### Arrowhead Creek Agricultural Wetland Fingers Saturated Herbaceous Community (HW4)

Chaffweed, Centunculus minimus

HW4: The north finger of the agricultural wetland is dominated by chaffweed and is approximately six feet wide at its widest point, narrowing to a thin line. The north and south fingers extending into the agricultural field are similar.

### Arrowhead Creek North End Seasonally Flooded Herbaceous Community (HW5)

Meadow foxtail, Alopecurus pratensis - common velvetgrass, Holcus lanatus - sedge, Carex species

HW5: This is the narrow drainage that widens into a wet sedge meadow that forms the headwaters of Arrowhead Creek in the north part of the site. Seven different sedge species were identified in this drainage and it may represent an historic community. It is surrounded by a weedy upland meadow (HU1).

### Arrowhead Creek North Upland Herbaceous Community (HU1)

sweet vernalgrass, Anthoxanthum odoratum - Canada thistle, Cirsium arvense - tall fescue, Festuca arundinacea - English plantain, Plantago lanceolata

HU1: This is a weedy upland meadow community with patches of Himalayan blackberry. Some mowing is occurring to control the blackberry. This community surrounds the sedge meadow listed in the previous table that forms the headwaters of Arrowhead Creek.

### Arrowhead Creek Central West and East Seasonally Flooded Shrub Community (SW1)

Pacific willow, Salix lasiandra [S. lucida var. lasiandra] - Piper's willow, Salix piperi - Scouler willow, Salix scouleriana

SW1: This is a large wetland shrub complex surrounding the central wetland meadow of the Arrowhead Creek headwaters complex. There are depressions that pond water late into the dry season. Access through this unit to the north proved unattainable due to dense branches and Himalayan blackberry.

### Arrowhead Creek East Area Upland Shrub Community (SU1)

Himalayan blackberry, Rubus discolor

SU1: Very weedy community dominated by Himalayan blackberry with only scattered black cottonwood trees. It is surrounded by wetlands (north, west and south) and houses to the east.

### Arrowhead Creek SE Corner Seasonally Flooded Deciduous Forest Community (FDW1)

Oregon ash, Fraxinus latifolia / water foxtail, Alopecurus geniculatus - reed canarygrass, Phalaris arundinacea

FDW1: This forested community is fairly diverse and well shaded; many young Oregon ash trees are regenerating in unvegetated depressions in the forest. This area is connected to the forest immediately north of the school with a paved recreational trail.

### Arrowhead Creek NE Area Saturated Deciduous Forest Community (FDW2)

Black cottonwood, Populus trichocarpa [balsamifera] / reed canarygrass, Phalaris arundinacea

FDW2: This community is a small forested wetland area that separates a wetland reed canarygrass meadow to the north from an upland Himalayan blackberry field in the northeast area of the site.

## Filbert Orchard

Beaked hazelnut, Corylus cornuta

This orchard located in the southwest portion of the site was an Oregon State University experimental agricultural project established circa 1965 (personal communication, Charlotte Lehan).

## National Vegetation Classification System Physiognomic Class:

Definitions are modified from UNESCO 1973 Formation Classes and are defined by the relative percent cover of the tree, shrub and herbaceous strata.

| | |
|---|---|
| Forest | Trees with their crowns overlapping (generally forming 60-100% cover). |
| Woodland | Open stands of trees with crowns not usually touching (generally forming 25-60% cover). Canopy tree cover may be less than 25% in cases where it exceeds shrub, dwarf-shrub, herb and nonvascular cover, respectively. No woodlands were found on the Wilsonville Tract. |
| Shrubland | Shrubs generally greater than 0.5m tall with individuals or clumps overlapping to not touching (generally forming more than 25% cover, trees generally less than 25% cover). Shrub cover may be less than 25% where it exceeds tree, dwarf-shrub, herb and nonvascular cover, respectively. Vegetation dominated by woody vines is generally treated in this class. |
| Herbaceous | Herbs (graminoids, forbs and ferns) dominant, generally forming at least 25% cover. Trees, shrubs and dwarf-shrubs generally cover less than 25%. Herb cover may be less than 25% where it exceeds tree, shrub, dwarf-shrub and nonvascular cover, respectively. |

## National Vegetation Classification System Hydrologic Regime:

Hydrological modifiers used to identify wetland units at the formation level (adapted from Cowardin et al. 1979).

| | |
|---|---|
| Permanently flooded | Water covers the land surface at all times of the year in all years. Equivalent to Cowardin's Permanently Flooded modifier. |
| Seasonally flooded | Surface water is present for extended periods during the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is very variable, extending from saturated to a water table well below the ground surface. Includes Cowardin's Seasonal, Seasonal-Saturated and Seasonal-Well Drained modifiers. This is the only hydrologic regime found on the Wilsonville Tract. |
| Saturated | Surface water is seldom present, but substrate is saturated to surface for extended periods during the growing season. Equivalent to Cowardin's Saturated modifier. |

# Site Wildlife

## Introduction

Wildlife observed in the Mill Creek forest during 2001 (Fishman Environmental Services, LLC 2002) included 43 species: eight mammals, 26 birds, three herptiles, three fish, one butterfly and two mollusks. The Mill Creek forest contains perennial streams, which provide a year-round water source and serve as wildlife dispersal and travel corridors. The streams also provide habitat for sensitive species, including red-legged frog and coastal cutthroat trout, which were observed in the stream. Streams are well shaded by a mature multi-layered forest canopy, which moderates water temperatures and adds instream debris. The large size and age of the forest provides habitat for interior forest species (e.g. winter wren). Some old growth trees measured 70 inches in diameter and snags are large enough to provide nesting sites for pileated woodpecker. Large woody debris on the forest floor is common and provides refugia for chipmunks and territorial singing perches for winter wren. Red-tailed hawk and great horned owl nest in the forest and seek prey in adjacent fields.

Small mammal trapping conducted in July 2001 by FES typically caught 7 to 10 deer mice each night. Other species captured included one wandering shrew adjacent to Mill Creek in a lady fern floodplain community and a spotted towhee amid sword fern at the base of a snag within a large pile of woody debris in the forest.

Wildlife observed in Arrowhead Creek wetlands included 22 species: one mammal, 19 birds, one herptile and one butterfly. Seasonal water is present on the site, but habitat diversity is limited and reduces overall species richness. Red-legged frogs have been observed in the area by students from local schools.

## Wildlife Observed on the Wilsonville Tract

Preliminary List, listed by common and scientific names (common, scientific).

### Fish

Cutthroat Trout, Oncorhynchus clarki
Redside Shiner, Richardsonius balteatus
Sculpin, Cottus species

### Herptiles

Common Garter Snake, Thamnophis sirtalis
Northwestern Salamander, Ambystoma gracile
Pacific Treefrog (Pacific chorus frog), Hyla regilla (Pseudacris regilla)
Red-legged Frog, Rana aurora

### Birds

American Crow, Corvus brachyrhynchos
American Goldfinch, Carduelis tristis
American Kestrel, Falco sparverius
American Robin, Turdus migratorius
Barn Swallow, Hirundo rustico
Bewick's Wren, Thryomanes bewickii
Black-capped Chickadee, Parus atricapillus,
Black-headed Grosbeak, Pheucticus ledovicianus
Brewer's Blackbird, Euphagus cyanocephalus
Brown Creeper, Certhia americana
Bushtit, Psaltriparus minimus
Chestnut-backed Chickadee, Parus rufescens
Common Yellowthroat, Geothlypis trichas
Dark-eyed Junco, Junco hyemalis
European Starling, Sturnus vulgaris

Golden-crowned Kinglet, Regulus satrapa
Great Blue Heron, Ardea herodias
Great Egret, Casmerodius albus
Great Horned Owl, Bubo virginianus
House Finch, Carpodacus mexicanus
Hutton's Vireo, Vireo huttoni
Kinglet, Regulus species
Northern Flicker, Colaptes auratus
Orange-crowned Warbler, Vermivora celata
*Pileated Woodpecker, Dryocopus pileatus
Red Breasted Nuthatch, Sitta canadensis
Red-tailed Hawk, Buteo jamaicensis
Ring-necked Pheasant, Phasianus colchicus
Savannah Sparrow, Passerculus sandwichensis
Scrub Jay, Aphelocoma coerulescens
Song Sparrow, Melospiza melodia
Spotted Towhee, Pipilo maculatus
Steller's Jay, Cyanocitta stelleri
Swainson's Thrush, Catharus ustulatus
Violet-green Swallow, Tachycineta thalassina
Western Bluebird, Sialia mexicana (nesting boxes on Dammasch Property)
Western Scrub Jay, Aphelocoma coerulescens
Western Tanager, Piranga ludoviciana
Western Wood Pewee, Contopus sordidulus
*Willow Flycatcher, Empidonax traillii
Winter Wren, Troglodytes troglodytes
Yellow-bellied Sapsucker, Sphyrapicus varius (on Lombardy poplar snag to north on the Dammasch property, 3/1/02)

*Sensitive species

## Mammals

Beaver, Castor canadensis (chew, dams)
Black-tailed Deer, Odocoileus hemionus
Chickaree, Tamiasciurus douglasii
Cougar, Felis concolor (presumed from tree scratch marks and confirmed sitings in the area)
Fox Squirrel, Sciurus niger
Raccoon, Procyon lotor
Townsend's Chipmunk, Eutamias townsendii
Vagrant Shrew, Sorex vagrans
White-footed Deer Mouse, Peromyscus maniculatus

## Butterflies

Ochre Ringlet, Coenonympha ochracea ochracea
Western Tiger swallowtail, Papilio rutulus

## Terrestrial invertebrates

Banana Slug, Ariolimax combianus
Red-band or Two-banded Snail, Monadena fidelis

## Potential Sensitive, Threatened and Endangered Species and Essential Habitat For Fish, Wildlife and Plants

Several sensitive species occur on the Wilsonville Tract. Restoration efforts and management techniques should protect existing habitats utilized by these species.

The northern red-legged frog (Rana aurora) is a federal species of concern and a state sensitive species of undetermined status. It inhabits wetlands and slow moving streams. It breeds in ponds, where it deposits large egg masses in January/February. Outside of the breeding season, adults are highly terrestrial and are frequently encountered in woodlands adjacent to streams. Red-legged frog adults were observed adjacent to Mill Creek and most likely breed in Mill Creek. Egg masses and adults have also been observed in water quality swales located north of the school that are piped into Arrowhead Creek (Bob Carlson, personal communication). Protecting surface water from sedimentation and other water quality declines will help protect breeding habitat. Maintaining forest health and cover will help protect adult frog habitat.

The pileated woodpecker (Dryocopus pileatus) is a state vulnerable species. It is associated with mature coniferous and deciduous forest habitat and requires large snags for nesting and snags and large woody debris for foraging. Optimum nest snags are at least 20-inches in diameter and 31-feet tall (Marshall 1996). Other habitat components include dense forest, high snag densities, stumps, large woody debris and tall shrub cover. All of these habitat features are present in the older forest adjacent to Mill Creek where the pileated woodpecker was observed. Preserving the forest and protecting snags will continue to provide pileated woodpecker breeding and foraging habitat.

The little willow flycatcher (Empidonax trailii brewsteri) is a federal species of concern and a state vulnerable species. It is found in willow thickets at the edges of streams or forest clearings. It eats mostly flying insects. It is a summer resident that typically arrives in Oregon in mid-May (Csuti 1997). It was common during the summer in riparian habitats of the Coffee Lake area, Arrowhead Creek, and Corral Creek (south of the Wilsonville Tract). Maintaining willow thickets and wetlands in the Arrowhead Creek drainage will continue to provide willow flycatcher habitat.

Coastal cutthroat trout (Oncorhynchus clarki) from the upper Willamette River evolutionarily significant unit (ESU) are currently designated as not warranted for listing by the US Fish and Wildlife Service and are not likely to be listed in the near future (they previously were being considered for listing). This ESU population occurs in riverine habitats that drain to the Willamette River upstream of Willamette Falls. The primary risks to the upper Willamette River ESU are habitat degradation in the tributary streams and negative effects of hatchery-origin cutthroat trout on the native populations through competition and hybridization. Cutthroat trout were observed in Mill Creek and Corral Creek and may be a resident population or move seasonally to the Willamette River.

The western bluebird (Sialia mexicana) is a state vulnerable species in western Oregon. In western Oregon, it breeds in forest clear-cuts with standing snags, agricultural lands and riparian woodlands. It requires cavities for nesting. Nest boxes have been installed in the vicinity of the project site by the Prescott Bluebird Recovery Project. Five boxes were installed on school or Metro property in 2002. Bob Carlson and students are monitoring these nest boxes and had two active nests with one producing offspring successfully. Nest boxes can provide needed nesting habitat for western bluebird as well as other species (e.g. swallow). It is important to keep out nuisance

species like house sparrows and European starlings that compete with native cavity nesters. Nest boxes with a slot opening rather than a round hole will permit native swallows to enter while excluding the house sparrow. Starlings generally are easy to exclude from nest boxes designed for songbirds because they are slightly bulkier than most species; using the smallest recommended hole diameter for native species usually will prevent starlings from entering the box. According to Bob Carlson, the holes in the existing nest boxes are small enough that the starlings can't enter, but they still can potentially reach in and eat hatchlings. Providing additional appropriate nesting opportunities will benefit cavity nesters as long as nest boxes are well monitored and nuisance species are excluded.

## Wildlife Corridors

The forests and stream/wetland drainages provide corridors through the site for wildlife traveling between the Willamette River and its greenway and habitats to the north. Habitats to the north of the site include the Mill and Corral Creek systems, the Living Enrichment Center site forests, the open space and proposed greenway(s) of the Villebois development on the Dammasch site, the Coffee Lake Creek corridor, Tonquin Geologic (scablands) corridor towards the City of Tualatin and the Tualatin River National Wildlife Refuge. To the south, lies the Mill Creek forest connected to Corral Creek and the Willamette River (corridor disrupted by Wilsonville Road), the Arrowhead Creek drainage connecting the site to the Coffee Lake Creek (Seely Ditch) corridor and the Willamette River including the Wilsonville Water Treatment Plant (corridor surrounded by more intense development and also disrupted by Wilsonville Road). Open areas of the site are used by coyote for dispersal and by redtail hawk for hunting grounds.

# Site Restoration

## Introduction

Site restoration for the Wilsonville Tract will represent and reflect a variety of native ecotypes that may have been present in the past.

Site restoration for the Wilsonville Tract means the protection and management of existing natural resources and calls for the replacement of non-compatible land uses such as agriculture with restored native landscapes.

Landscape enhancements such as pedestrian and bicycle circulation, parking and picnic shelters respond to the requirements of a whole systems approach to protecting and restoring the site. Landscape improvements will be field sited as to ensure that the net result of such improvements is compatible with the restoration and enhancement of native ecotypes.

## Background

The earliest human occupation of the Willamette Valley dates to about 10,000 years ago. Early inhabitants depended heavily on the hunting of deer and elk, and led a highly mobile existence. By 6,000 years ago, a more diverse economic strategy had emerged, including the collection and processing of camas, acorns and hazelnuts, in addition to hunting and salmon fishing. By 4,000 years ago, a decrease in a nomadic lifestyle was linked to a greater reliance on stored food resources and smaller home ranges, and resulted in the establishment of villages on high river terraces and valley margins. Prairies in the Willamette Valley were fire-maintained to enhance productivity of various plant resources.

British and American settlement began following the establishment of fur trade posts in the 1820's and 1830's. Open prairies were appropriated for agricultural use. Extensive clearing and the cultivation of non-native crops were central to the economy of 19th century communities. Intensive timber harvest had a dramatic effect on ecological structure and hydrology. The historic development of towns and cities, river diking and damming, and roads and railroads all caused significant local changes to the environment.

Prior to European settlement, a mixture of Douglas fir forest, Oregon white oak savannah, riparian woodland, prairie and extensive wetlands occupied the Willamette Valley. More than 80 percent of oak savannahs have been lost to agriculture and urban land uses. Fire suppression has led to the succession of prairie remnants and oak savannahs to Douglas fir-dominated woodlands/forests.

## Areas of Restoration

### Legacy Creek

The highest priority solution for Legacy Creek should include addressing the out-of-basin transfer and arresting the head cuts currently migrating through the channel. Addressing the out-of-basin transfer should include a combination of stormwater detention and redirecting flow to its historic basin. Arresting head cuts within the channel could be accomplished by placing rock, cobble and large woody debris in the channel to backwater and stabilize the head cuts.

Addressing side slope failure represents a close second priority for Legacy Creek. The most practicable approach for addressing side slope failure appears to be through arresting head cuts and revegetation of slopes. Arresting head cuts should include erosion

control at the toe of slopes. This could be accomplished through a combination of placing large woody debris and stream substrate to provide grade control, replenishment of streambed substrate and habitat structure. Vegetating exposed slope failures will establish a root mat to stabilize the slope and reduce surface erosion. This may be accomplished using bio-engineered slope rehabilitation techniques such as brush layering and brush packing. However, addressing site slope failure without eliminating out-of-basin stormwater transfer can have only limited success.

The third priority for Legacy Creek should be restoring drainage patterns in the headwaters that have been filled. The headwater channels will provide improved habitat and water quality. Providing a more complex edge between open field and forest will enhance wildlife habitat, and establishing a mildly sloped vegetative buffer between open field and channel will improve water quality. Removing fill and restoring historic channels should include replenishment of stream substrate material to allow for natural recruitment to lower Legacy Creek.

## Mill Creek

Restoration and enhancement strategies in Mill Creek could be active or passive. Passive approaches to enhancement and restoration emulate natural processes, but results come slowly over time. Active approaches emulate the results of many centuries of natural process work and are much quicker. Passive approaches are generally much less expensive than active approaches to restoration.

Active enhancement or restoration would involve wood placements, channel grading and riparian planting that would re-activate the historic valley bottom. This method would enable floodwater to flow across the historic floodplain on a relatively frequent interval.

Passive enhancement and restoration strategies would supplement the channel with minimal large wood material placements to allow the development of habitat and accelerate the development of a new flood plain within the incised channel. This type of approach is less exacting, but would emulate what would occur when large conifers fall into stream channels in disturbed environments. Where appropriate, conifer plantings would take place to help re-establish future wood material and develop a more complex riparian forest community having an alder and cedar component.

## Arrowhead Creek

Restoration of the headwaters of Arrowhead Creek will provide opportunities for habitat enhancement and improved hydrologic function. These efforts should be performed in conjunction with returning the Villebois area run-off to its original watershed. Returning the Villebois flows back to Arrowhead and Coffee Lake Creeks requires detention of stormwater run-off to avoid adversely impacting Arrowhead and Coffee Lake Creek. Detention of Villebois flows could be attained by constructing wetlands within the Arrowhead Creek basin.

## Oak Savannah

An oak savannah is a community of scattered oak trees (in Oregon these are the Oregon white oak) above a layer of prairie grasses and forbs. The trees are spaced far enough apart so that no crowns are touching (no closed canopy) and the grasses and forbs receive plenty of sunlight. In the midwest, oak savannah is considered a transition ecosystem between tall grass prairie and woodland environments

Oak savannah relies on periodic disturbances such as fire, grazing and drought to flourish. Such disturbances prevent other trees from establishing themselves and turning the habitat into a forest community. Oak trees and prairie grasses are resilient to fire, while the trees of a woodland community are not. Oak trees have extremely thick bark that protects them from fire and prairie grasses have evolved so as to thrive after a fire. Therefore, fire allows the

oaks and grasses a competitive advantage over other trees that may try to invade the savannah. Without fire, tree saplings will colonize in the savannah and are able to take over, shading out and eliminating the grass and forb species. Over time, where once there was an oak savannah, succession to a woodland habitat occurs. Oak savannahs have become practically extinct because European settlers suppressed natural fire cycles and the fires set by Native Americans. Farming and development has also helped eliminate the oak savannah ecosystem. Tree-ring studies indicate that fires occurred frequently in Oregon's Willamette Valley from at least 1647 until pioneer settlement in the 1850s.

Oregon white oak often grows on gently sloping terrain and can occupy sites that are too droughty or poorly drained for other tree species. The multi-stemmed shoots of Oregon white oak seedlings continually die back and new stems sprout until one stem outgrows all others. The taproots of seedlings develop rapidly, aiding establishment in hot, dry sites. Oregon white oak needs ample sunlight and will decline and die if shaded out.

Oregon white oak stands with a mix of dead, decadent and healthy trees of various sizes and growth forms will attract a greater variety of wildlife than those with only healthy trees of uniform size and age. The maintenance of dead branches with cavities provides acorn storage areas and nesting opportunities.

Ponderosa pine is a component of an oak savannah and has existed within the Willamette Valley for approximately 7,000 years. It is a distinct sub-species from the ponderosa pines found east of the Cascade mountains.

## Agricultural

Approximately 140 acres of the Wilsonville Tract is currently under agricultural use. Historically, the entire low slope area east of the steeply sloped creek watersheds were tilled or grazed for agricultural uses. Drainage tiles were constructed in low-lying swales in the central area, emptying into nearby drainages referred to as Legacy and Pristine Creeks in the master plan. These drainage tiles increased the tillable area and concentrated water flow to the adjacent streams. Records locating the drainage tile system have not been found.

The current tenant farmer has been utilizing the property under contract for the last 10 years, growing mostly row crops on 135 acres. The current crop of rye grass for seed production will continue under contract with Metro until the transition to restoration occurs.

The 6-acre filbert orchard adjacent to Wilsonville Road is maintained by a second tenant under contract with Metro. The orchard was used from 1960-1979 by OSU for research on Eastern Filbert Blight. Since the research was phased out, its utility is primarily commercial. The contract with the tenant was conveyed to Metro at the time of purchase. This agricultural use should continue until sufficient funds are available and the timing is appropriate for the removal of the orchard and its replacement with native vegetation.

Until a restoration plan is developed, funds and appropriate plant material are available, and a land management commitment is made to maintaining the property, any area under cultivation should remain under agricultural use because:

- responsible farming practices suppress noxious weeds at no cost to the public;
- restoration can be implemented in phases with farming;

- maintaining good working relations with the farming community fosters public acceptance;
- restoration can be more cost effective utilizing farmers' equipment and expertise; and,
- revenue generated from the lease helps defray land management costs.

In managing the agricultural use at the site, the guidelines below should be followed:

- Maintain the agricultural lease with the current tenant farmers under current terms. Given the limited time anticipated for future agricultural use on site, finding another farmer in the area willing to invest in the site for the short term may be difficult.
- Working within the terms of the agricultural lease, strive to minimize the environmental impact of agricultural practices without compromising farming practicality, including reducing use of pesticides and increasing the buffer area around water features.
- Avoid potential conflicts with currently sanctioned agricultural use and interim public use through good communication between all parties.
- Provide a minimum of one-year advance notification to the tenant farmer when significant modifications of the lease are anticipated.
- Research records held by U.S.D.A. Natural Resources Conservation Service to document location of the drain tile system.
- No additional tile drainage in the agricultural field should be constructed.

Explore other agricultural use options that are more compatible with wildlife habitat enhancement.

**Successional Plantings to Create and Maintain Native Forests**

The Nature Conservancy has identified three general habitat types as conservation priorities in the Willamette Valley: oak savannahs and woodlands, wetlands and bottomland hardwood forests. A fourth type, native prairie grasslands, is also a conservation priority, but only small fragments remain.

Maintenance of these habitats is dependent in part on periodic burning. Without fire suppression, many oak savannahs have developed into oak woodlands and eventually Douglas fir dominated forests. Oak savannah is a classic example of a community whose continued existence depends almost entirely on a program of active restoration and maintenance. Due to the toxic substance released by oaks, there may be a unique community beneath its boughs, distinct from upland prairie plant communities without oaks.

The conversion of the perennial ryegrass agricultural fields to native prairie and savannah must be done purposely, to avoid invasion of noxious weeds such as Scot's broom, Himalayan blackberry and thistles. The National Park Service, which is involved with prairie and oak savannah preservation and restoration in the Mississippi National River and Recreation Area in Minnesota, notes that a cover crop is a useful step in preventing erosion and weeds. Conversion of the perennial ryegrass fields to a cover crop that would enrich the soil, such as a nitrogen-fixing legume, is recommended.

Seeding should be done in spring or fall during cool wet periods to ensure growth of seedlings prior to erosive winter rains. It has been suggested that the site should not be tilled to install seed since this can regenerate an undesirable dormant seed bank, but rather to use a no till drill technique. We recommend experimenting with both techniques on a small scale to determine the best technique for the

site. The dormant seed bank could contain native grasses, or they may be entirely absent since the site has been in grass and grass seed/agricultural production for so long. After seeding, fertilizers should not be used as they encourage weed growth.

The method of savannah restoration on this site will be to first establish native prairie and then to plant oak trees. This is a long-term project that will require several decades or more. Oaks may be started in clumps to ensure survival and then thinned over time to obtain the desired tree density, which may be less than 50 percent canopy closure. Establishing the groundcover first before planting shrubs and trees minimizes the costs and time associated with restoring this type of habitat.

Burning is the preferred method of maintaining native prairie and oak savannah. Burning rejuvenates the soil, releases nutrients and discourages weeds and woody plant invasion

Burning must be coordinated with the local fire department and city and county personnel, along with public notification of neighboring residents. Mowing before weed seed sets in the summer is recommended, especially during the first few years of establishment. Burning should occur after the prairie community has established (after 3 or more years) and should occur once every three to five years to control invasion of poison oak, Scot's broom, non-native hawthorn and Douglas fir. Mowing and using the trails as a fire-break are recommended. Burning should be done in a prescribed manner, only after good drenching rains in the fall have wetted the heavier fuel materials and the lighter fuel materials have dried out. Identification and removal of weeds, by hand or with the use of an approved herbicide, should occur as soon as possible and as often as necessary.

Mowing and grazing may be used as additional tools or as a substitute to burning, although mowing or grazing may not kill woody species or decrease the cover of woody species as compared with an unmowed control in a wetland prairie. Hand-removal is also a method of control for invasive weeds and woody species.

## Forest Lands

Some of the forested areas on the Wilsonville Tract are associated with creeks, wetlands and the surrounding upland areas. Classified as riparian zones, the vegetation and microclimate conditions in these forests are products of the combined presence and influence of perennial or intermittent water, associated high water tables, and soils that exhibit some wetness characteristics.

Early and late successional (e.g. old growth) forest communities are found on the Tract. Succession is a series of changes in species that occupy a given area through time. Plant communities are in a constant state of fluctuation due to changes in their environment.

Primary succession is the initial stage of plant communities following a severe disturbance. Secondary succession begins either after the plant community of the primary successional phase has been established or following a more mild disturbance which leaves some of the existing habitat in place.

The final stage is the climax community, which contains vegetation that has reached a highly stable condition and undergoes change very slowly. Plants within climax forests can reproduce successfully beneath their own shade and therefore maintain the community indefinitely under the prevailing conditions. Secondary succession reaches the climax stage when the plant community growth form has come into equilibrium with its physical environment. Climax forests conditions on the Wilsonville Tract would have included oak woodlands or oak savannahs in upland areas in the presence of fire (post-settlement of the Willamette Valley included the control of periodic fires), and Douglas fir, mixed upland forest within the Tract's riparian areas.

Restoring or enhancing forested habitats will entail a method known as "managed succession". In applying managed succession to the site, the objective is to manipulate the introduction of native pioneer and secondary successional species to develop site conditions that are conducive to desirable climax, or later successional species.

There are three components of managed succession: designed disturbance, controlled colonization, and controlled species performance. Designed disturbance is any activity to enhance site availability for plant growth, which may include burning, clearing, soil amendments, thinning, or mowing. Controlled colonization typically entails adding plants to a site. These plants could range from seedlings to large plants.

Expanding the mixed and deciduous forests into the existing agricultural fields will minimize the abrupt, straight edges of the existing forests. Succession will be managed in these areas to restore the native forest habitats and replace the current agricultural use.

Forest interior area sustains the viability of the plant and animal communities that depend on its generally stable environmental conditions. Some edge species, such as deer, will benefit from the presence of extensive edge between different habitats, closed mixed forest and open meadows.

A number of steps will be necessary in restoring forest habitat on the Wilsonville Tract. First, the site will be prepared for planting, which will include clearing the agricultural fields and amending the soil. Second, a canopy with desirable early successional species such as red alder or bigleaf maple will be established. The species selected should represent the natural, early successional stages or representative plant communities in the adjacent forested areas. Third, once the early-successional trees grow large enough to provide shade, shade tolerant trees will be interplanted, such as western red cedar, or understory shrubs, such as salal. Other steps may also be necessary, including periodic thinning of the reforested areas, and controlling invasive species.

Sensitive areas, old growth or streamside areas, should be closely monitored and protected from negative impacts. Trail locations should be restricted in these areas. Forest management should include retaining decaying and standing trees, enhancing vertical structure within the forest stands, and maintaining sufficient buffers to protect water quality in the creeks and wetland areas.

By girdling or felling Douglas firs and other target species, snags can be created for wildlife, and coarse woody debris (rotting logs, stumps, or large branches that benefit wildlife and the forest ecosystem) can be provided in the understory. Within the restored and existing forested areas, they should be managed to maintain their health and vitality, which will promote sustainable, productive, and resilient ecosystems.

## Wetland

The site presents an excellent opportunity to enhance and restore wetlands on the site. Wetland restoration and enhancement opportunities are present in both the Arrowhead Creek drainage and the Mill Creek and tributaries drainage on the site. The reed canarygrass-dominated and agriculturally-disturbed wetlands located west and north of the schools, which form the headwaters of Arrowhead Creek, can be enhanced and expanded. Enhancement techniques include increasing habitat diversity in reed canarygrass-dominated areas by creating shallow depressions to provide mud flats or open water areas, improving shade by planting more Oregon ash, willow trees and shrubs, and improving riparian buffers along streams.

Parts of the Arrowhead Creek site present an excellent opportunity to restore a rare historic Willamette Valley willow swamp community type by planting Geyer willow (Salix geyeriana). The Killin Wetlands (Banks Swamp) was recently acquired by Metro and is a rare example of the relic interior Willamette Valley willow swamp with organic soils, which historically occurred on an estimated 10,000 acres in the Willamette Valley, prior to clearing and draining for agriculture (primarily onions and pasture).

Enhancement and restoration recommendations to the agricultural areas include planting native species and restoring native wetland prairie habitat in areas disturbed by agricultural practices, especially in historic drainage areas. It is possible to use the daylighted stormwater run-off from the Villebois site to enhance the Arrowhead Creek wetland drainage. Care should be taken to preserve the diverse sedge meadow present in the north end of the drainage.

The mapping of hydric soils on the site directs where wetland restoration should occur and has the highest probability of success. In addition to the hydric Dayton and Wapato units on the site, Amity silt loam has hydric Dayton inclusions and may also be suitable for wetland restoration; refer to Soils Analysis map.

Wetlands can also be restored in currently plowed portions of the field that drain to Legacy Creek and Pristine Creek. Water flows, separate from the outfall from the Villebois site and Pristine Creek, flow through the Triangle Forest in the northwest area of the site, enter existing drain tile and are piped underneath the field before emerging at the head of the intact riparian forest in the Pristine Creek canyon. The drain tile has failed in one location approximately 200-feet south of the forest edge, where a sink-hole approximately 5 to 8 feet wide and 45-feet long is present. The piped sections of the stream can be day-lighted creating channel meanders and restoring wetlands adjacent to the stream channel.

# Site Revegetation

## Areas of Revegetation

### Mill Creek Forest

Extending the upland Mill Creek Forest into the agricultural field provides an opportunity for softening the straight lines along the edges of the existing forest. Reforestation of the agricultural field around the existing forest will be simply an extension of the desired native species already present within the forest. Appropriate species to plant as herbaceous cover include California brome (Bromus carinatus), blue wildrye (Elymus glaucus), sword fern (Polystichum munitum), dull Oregon grape (Berberis nervosa), mountain sweet cicely (Osmorhiza chilensis) and Alaska oniongrass (Melica subulata). After the herbaceous layer is established and is relatively weed free, shrubs and saplings can be planted, including vine maple (Acer circinatum), Saskatoon serviceberry (Amelanchier alnifolia), ocean spray (Holodiscus discolor), Indian plum (Oemleria cerasiformis), baldhip rose (Rosa gymnocarpa), thimbleberry (Rubus parviflorus, and snowberry (Symphoricarpos albus). Tree species to plant include Douglas fir (Pseudotsuga menziesii), bigleaf maple (Acer macrophyllum), western flowering dogwood (Cornus nuttalli) and Oregon white oak (Quercus garryana). Western red cedar (Thuja plicata) and red alder (Alnus rubra) could be planted in moister areas.

### Triangle Forest

The extension of the Triangle Forest is a blended approach of extending the existing native forest communities and developing a transition from scattered woodland to a more sparsely wooded oak savannah, as discussed below. Appropriate species to plant as herbaceous cover include California brome (Bromus carinatus), California oatgrass (Danthonia californica), blue wildrye (Elymus glaucus), Dewey's sedge (Carex deweyana), Henderson's sedge (Carex hendersonii) and sword fern (Polystichum munitum). Native shrubs include Saskatoon serviceberry (Amelanchier alnifolia), ocean spray (Holodiscus discolor), cascara (Rhamnus purshiana), Nootka, clustered wild and baldhip roses (Rosa nutkana, R. pisocarpa and R. gymnocarpa), thimbleberry (Rubus parviflorus) and snowberry (Symphoricarpos albus). Sapling trees include Oregon white oak (Quercus garryana) in upland areas and Oregon ash (Fraxinus latifolia), red alder (Alnus rubra), Sitka willow and other willow species (Salix sitchensis and Salix species) in historic drainage areas (Pristine Creek and the drainage to Arrowhead Creek). Slough sedge (Carex obnupta) and spreading rush (Juncus patens) are also recommended in the herbaceous layer in these moist drainage areas.

### Oak Savannah and Upland Prairie

A wide variety of plant species occur in Oregon white oak communities. In western Washington and the Willamette Valley more than 90 plant species are associated with Oregon white oak. Pacific poison oak (Rhus diversiloba) is common on dry sites, and California hazel (Corylus cornuta) and western swordfern (Polystichum munitum) grow on moist Oregon white oak sites. Drier sites include ponderosa pine (Pinus ponderosa) and Douglas fir (Pseudotsuga menziesii). Moister sites will have bigleaf maple (Acer macrophyllum) and western hemlock (Tsuga heterophylla) (Gumtow-Farrior and Gumtow-Farrior, 1994). Western hemlock has not been documented as naturally occurring within the City of Wilsonville and is not present on the Wilsonville Tract.

The nature of the historic grassland (prairie) communities is strictly conjectural, since grazing and introduction of alien species have altered all remaining stands to some degree. A list of species has

been compiled based on literature research and refined specifically to the conditions of the site (many rocky soil adapted species have been excluded). It is apparent that the grassland prairie and oak savannah communities are maintained by fire or other human influences.

It is important to establish a grass cover first; California brome (Bromus carinatus), California oatgrass (Danthonia californica) and blue wildrye (Elymus glaucus) are recommended as a base mix. Then other forbs listed below can be planted in patches or clusters for color and diversity, including showy milkweed, aster, brodiaea, broadpetal strawberry, Oregon iris, rose checker-mallow and narrow-leaved sunflower. Then the shrubs and trees can be brought into the prairie as discussed previously to restore oak savannah and woodlands.

The following lists were developed as a framework for restoration of desired plant communities on the site:

**Trees**
Oregon White Oak (Quercus garryana) - widely spaced
Madrone (Arbutus menziesii)
Ponderosa Pine (Pinus ponderosa, Willamette Valley variety)

**Shrubs (for oak woodland)**
Saskatoon Serviceberry (Amelanchier alnifolia)
Wild Rose (Nootka rose (Rosa nutkana),
Baldhip Rose (Rosa gymnocarpa)
Vine Maple (Acer circinatum)
Ocean Spray (Holodiscus discolor)
Indian Plum (Oemleria cerasiformis)
Thimbleberry (Rubus parviflorus)
Snowberry (Symphoricarpos albus)

**Herbs (Forbs)**
showy Milkweed (Asclepias speciosa)
Common California Sster (Aster chilensis)
Hall's Aster (Aster chilensis var. hallii)
Brodiaea (northern saitas or ookow (Brodiaea congesta)
Elegant Brodiaea (Brodiaea elegans)
White Brodiaea (Brodiaea hyacinthina [Triteleia hyacinthina])
Willamette Valley Bittercress (Cardamine penduliflora)
Clarkia (small-flowered godetia (Clarkia quadrivulnera [C. purpurea var. quadrivulnera] - Jepson)
Farewell-to-spring (Clarkia amoena)
Slender Clarkia, (Clarkia gracilis)
Wooly Sunflower (Eriophyllum lanatum var. lanatum)
Broadpetal Strawberry (Fragaria virginiana var. platypetala)
Oregon Iris (Iris tenax)
Columbia Lily (Lilium columbianum [Lilium canadense var. parviflorum])
Mountain Sweet Cicely (Osmorhiza chilensis)
Western Buttercup (Ranunculus occidentalis)
Purple Sanicle (Sanicula bipinnatifida)
Pacific Sanicle (Sanicula crassicaulis)
Rose Checker-mallow (Sidalcea virgata)
Douglas' Grasswidows (Sisyrinchium douglasii [Olsynium douglasii])
Narrow-leaved Sunflower (Wyethia angustifolia)

**Herbs (Grasses)**
Idaho Bentgrass (Agrostis idahoensis)
California Brome (Bromus carinatus)
Columbia Brome (Bromus vulgaris)
CaliforniaOatgrass (Danthonia californica)
Blue Wildrye (Elymus glaucus)
California Fescue (Festuca californica)
Western Fescue (Festuca occidentalis)
Alaska Oniongrass (Melica subulata)

Bottlebrush Squirreltail (Sitanion hystrix [Elymus elymoides])
Big Squirreltail (Sitanion jubatum)
Lemmon's Needlegrass (Stipa lemmoni - with Ponderosa pine)
Nodding Trisetum (Trisetum cernuum)

## Animals Associated with Oregon White Oak Trees

### Birds

Acorn Woodpecker (Melanerpes formicivorus)
Lewis' Woodpecker (Melanerpes lewis)
White-Breasted Nuthatch (Sitta carolinensis)
Western Bluebird (Sialia mexicana)
Pileated Woodpecker (Dryocopus pileatus)

### Mammals

Western Gray Squirrel (Sciurus griseus)

### Reptiles

Sharptail Snake (Contia tenuis)

## Wet Prairie

Wetland prairies are typically dominated by tufted hairgrass, which covers between 30 and 50 percent of a site, and often have an undulating topography containing low ridges and troughs, or scattered depressions that form vernal pools (Guard, 1995). Tufted hairgrass typically forms tall pedestals and the spaces between the pedestals are shallowly flooded with standing water for most of the winter. The water dries by late spring and a showy array of wildflowers fill in. Tufted hairgrass is a hardy species that can re-populate disturbed sites fairly rapidly (Guard). Wet prairies in the Willamette Valley support an unusually high diversity of plant species due to a variety of microhabitats and hydrologic conditions. Several species that are adapted specifically to this habitat are endemic to the Willamette Valley - they do not occur naturally anywhere else in the world - and many of them have become rare, including Bradshaw's lomatium, white-top aster, Willamette Valley daisy and pale larkspur. Less than 1 percent of the original native wetland prairies remain.

### Shrubs

Geyer Willow (Salix geyeriana)
Piper's Willow (Salix piperi)
Sitka Willow (Salix sitchensis)
Pacific Willow (Salix lasiandra [S. lucida var. lasiandra])
Nootka Rose (Rosa nutkana)

### Herbs (forbs)

Common Camas (Camassia quamash)
Leichtlin's Camas (Camassia leichtlinii)
Lowland Cudweed (Gnaphalium palustre)
Rareflower Heterocodon (Heterocodon rariflorum)
Slender Phlox (Microsteris gracilis [Phlox gracilis ssp. gracilis]
Yellow Monkey flower (Mimulus guttatus)
Rosy Owl-clover (Orthocarpus bracteosus)
Fragrant Popcorn-flower (Plagiobothrys figuratus)
Scouler's Popcorn-flower (Plagiobothrys scouleri - currently present in ag. wetland)
Slender Cinquefoil (Potentilla gracilis)
Tall Woolly-heads (Psilocarphus elatior)
Oregon Saxifrage (Saxifraga oregana var. oregana)
Narrow-leaf Blue-eyed Grass (Sisyrinchium angustifolium [idahoense])
Early Blue Violet (Viola adunca)

### Herbs (grasses)

Spike Bentgrass (Agrostis exarata)
American Sloughgrass (Beckmannia syzigachne)
Tufted Hairgrass (Deschampsia cespitosa)

Western Mannagrass (Glyceria occidentalis)
Meadow Barley (Hordeum brachyantherum)

**Herbs (rushes and sedges)**
Dense Sedge (Carex densa - currently present in wetland to north)
Greensheathed Sedge (Carex feta)
Thick-headed Sedge (Carex pachystachya- currently present in wetland to north)
Pointed Broom Sedge (Carex scoparia - currently present in wetland to north)
Foothill Sedge (Carex tumulicola - currently present in wetland to north)
One-sided Sedge (Carex unilateralis)
Creeping Spikerush (Eleocharis palustris)
Tapered Rush (Juncus acuminatus)
Jointed Rush (Juncus articulatus)
Sierra Rush (Juncus nevadensis)
Spreading Rush (Juncus patens)

It appears inappropriate at this time to plant sensitive species, species of concern, rare, threatened or endangered species, due to the large numbers of visitors expected at this site. If future conditions warrant planting sensitive species, we have identified meadow sidalcea (Sidalcea campestris) as suitable for planting in the upland prairie and white-top aster (Aster curtus), pale larkspur (Delphinium leucophaeum) and Willamette daisy (Erigeron decumbens var. decumbens) as suitable for planting in the wetland prairie of the site.

# Maintenance

## Invasive Species Control

Noxious and invasive weeds occurring on the Wilsonville Tract include Himalayan blackberry and English ivy in the upland forest and reed canarygrass in wetland areas. English holly is present in scattered small locations in the Mill Creek forest and thistles are present in parts of the Arrowhead Creek wetland.

Himalayan blackberry is present in the disturbed outer forest edges. English ivy is the greatest management problem in the Mill Creek forest. It is dominant in the upland forest understory and is creeping up many trees. The first step towards its removal has already been started on the vines from the trees; however, many vines continue to crawl up trees and spread through the understory. A large patch of English ivy is present as a thick groundcover in approximately the outer 100-feet of the Douglas fir - bigleaf maple forest community in the Triangle Forest area and it has also invaded the trees.

About 700 goats were brought in during October 2002 to graze approximately four acres of ivy and blackberry infested areas in the southeast corner of the Mill Creek forest. Metro is monitoring the success of this alternative approach to controlling invasive species.

A reed canarygrass monoculture is present along Pristine Creek in the Triangle Forest on the site and forms large stands in the wetlands associated with the headwaters of Arrowhead Creek.

Management strategies for each species depends on specific unit conditions and goals. An integrated pest management (IPM) plan will optimize chances of success by utilizing a variety of control methods (e.g. hand-pulling, animals, mowing, fire, biological, chemical).

Management recommendations for specific invasive weeds are included in the following paragraphs. Additional invasive species are discussed, including teasel, Scot's broom, purple loosestrife, Japanese knotweed, Robert's geranium, quack grass, field morning glory, tansy ragwort, English hawthorn and velvetgrass. Although these species are currently not a problem on the site, they are potential invaders and should be eradicated as quickly as possible, if sighted.

### English Ivy (Hedera helix)

English ivy removal is a long-term project that involves successive removal and monitoring of vines growing on trees, on the ground and in the soil. It is important to remove ivy with as little disturbance to forest soils and native vegetation as possible; avoid working when soils are saturated to prevent soil compaction and during the growing season (March through June).

The first step is to remove reproductive aerial growth from tree trunks to prevent ivy from spreading through seed dispersal. Trees provide a focal point for volunteers and a reference point for success. This can be accomplished by "girdling" approximately 5-feet of ivy from around the tree from ankle to shoulder height. Every vine must be cut and removed and pulled down from the girdled area without injuring the bark of the tree. If one vine remains, ivy will continue to grow on the tree. Loppers and folding pruning saws seem to work best to cut the ivy and protect the tree, because inexperienced volunteers can see the blades better. Hand-pruners in inexperienced hands can damage the bark more easily. Retaining vines above shoulder height is fine; they will wither and cling to tree and provide food (insects) for wildlife.

The second step is to remove vegetative ground crawling ivy from a minimum of 4 feet surrounding the tree or in areas where ivy is not climbing up trees. This is best accomplished by pulling; a shovel or weeder may occasionally be required to loosen the soil. One technique is to have a group of 4 or 5 people in a line pull and roll up the ivy as they remove it; cutting it around shrubs in order to avoid damaging them. Ivy can be left to compost on the forest floor if it does not contain fruiting bodies. Ivy removed from trees with fruit should be disposed of off-site.

A winter application of glyphosate herbicide with an appropriate surfactant can be applied to large ground areas infested with ivy in order to protect native shrubs and herbs.

In general, protect each ivy-free area by removing ivy invading at the edges and working outward to enlarge ivy-free areas each year. This will maximize the ability of native species to recolonize cleared areas and if cleared areas are not naturally recolonized they can be planted with native species. Start slowly and evaluate how the herbaceous layer responds and whether native plants will need to be supplemented. In very dense patches of ivy, there may not be any viable native seeds in the seedbank and other noxious species (e.g. Robert's geranium) might invade. If native seed or plant starts are needed to supplement natural native plant regeneration, proceed with ivy removal only as fast as dictated by the amount of native plant material available. Monitor restoration areas and flag and map the extent of the population each year to evaluate progress.

### Himalayan Blackberry (Rubus discolor)

Himalayan blackberry forms dense thickets in riparian and upland areas. The best strategy for controlling blackberry thickets in grasslands is to mow in the summer (late July) when the berries are green and again in the late fall; this weakens roots by reducing energy storage. In the spring when regrowth begins, spray leaves with a broadleaf herbicide (as a component of an IPM program). Only an herbicide approved for use in wetlands (i.e. Rodeo) should be used in wetland or riparian areas. In forest margins, a similar approach can be used, except more care is necessary to protect native species. Bare soil areas that remain after dense blackberry thickets should be established with desirable native species (e.g. California brome, Bromus carinatus and blue wildrye, (Elymus glaucus). It takes repeated mowing, spraying and seeding to control blackberry. Another technique used to control blackberry is to mow blackberry thickets and overplant mowed areas with trees. In the Corral Creek forest this strategy has already been used. In meadows where seedling trees have already been planted, blackberry should be carefully cut with a weed-wacker until seedlings are approximately 10 feet tall and able to grow above the blackberry and eventually suppress its growth with shade cover.

### Reed Canarygrass (Phalaris arundinacea)

Reed canarygrass forms a monoculture in open areas and is the dominant species in the herbaceous stratum of forested and scrub-shrub wetlands on the site. The distribution of native plants within these areas is less than 5% and typically includes species that tolerate slightly different hydrologic regimes. In the Pacific Northwest, reed canarygrass has been controlled by long-term inundation and/or by using a combination of glyphosate herbicide (i.e. Rodeo) application, prescribed fire and tillage, with mixed results. Inundation stresses reed canarygrass and favors obligate wetland species that tolerate wetter hydrologic regimes. Inundated areas may support native species such as bulrush, spikerush and wapato; but could also favor other invasive weed species such as purple loosestrife and water pennywort. An increase in water depth might also increase nutria populations, which could decimate populations of native emergent species that are being established. If inundation is used as a management strategy it will have to include monitoring of vegetation changes as well as nutria populations.

Herbicide (glyphosate) is typically used in combination with tillage and fire. Herbicide should be applied when the plant is nearest to flowering and the carbohydrate load within the soil is at a seasonal low. Good results have been obtained from mowing the grass to a height of 3-feet and then applying herbicide to the exposed foliage. This can be followed by a burn (if allowed in the suburban community) to reduce the foliage, thatch and seedbank. Soils can be tilled to allow the seedbank to germinate and repeat the process. On drainages where reed canarygrass dominates herbaceous cover upstream or downstream of the project site, it might not be worth controlling since there is a ready source available to repopulate the site. In these situations, it might be better to enhance the reed canarygrass community by excavating small ponds or by over-planting with willow or Oregon ash.

### English Holly (Ilex aquifolium and other species)

English holly is a cultivated tree from Europe. To control holly, remove all seed bearing berries and cut off branches, then cut the trunk down to within 10 inches of the ground and paint on a woody plant herbicide to the cambium layer of the remaining trunk stem. The best time for this process is in the fall when the tree is going dormant.

### Canada Thistle (Cirsium arvense) and Bull Thistle (Cirsium vulgare)

The best method for controlling thistle is a combination of herbicide spraying and mowing. Spray rosettes in the spring (May) with an appropriate herbicide as early as possible before the rosettes become obscured by other vegetation. In dense areas, spray can be applied with a tractor-mounted boom; otherwise it should be spot-sprayed. For plants that survive spraying, mow during flower bud stage and at the first sign of purple bloom, but before full bloom to prevent seed production and further invasion. Thistle management requires diligent pro-active monitoring and maintenance.

## Site Stormwater

The approach to handling and maintaining stormwater on the Wilsonville Tract should strive to emulate historic hydrologic conditions. This requires adopting a stormwater philosophy of reducing the sources of run-off, storing water and increasing the contribution to groundwater and evaporative losses where runoff occurs. This approach shall minimize runoff by utilizing Low Impact Development (LID) principles and methods. Common LID methods include: mildly sloped grass-lined swales, bio-retention swales, permeable pavers, roof gardens, rainwater harvesting and rain gardens. These LID practices will be used in concert with one another to reduce run-off at its source. The emulation of historic hydrologic conditions also includes restoring historic watershed areas by removing stormwater diverted from Villebois site to Legacy Creek and returning that run-off back to the historic drainage basins of Arrowhead Creek and Coffee Lake Creek.

### Constructed Wetlands for Stormwater

Construction of wetlands may be the most effective way of reducing the run-off response (see Hydrology section) for the stormwater flows being diverted from the Villebois site. These flows should be returned to their historic drainage basin. (Arrowhead Creek). It is recommended that wetlands created to receive stormwater be separate from existing wetlands to avoid detrimental impacts to existing wetlands and ease environmental permitting. These created wetlands will act as large bio-retention systems that treat stormwater prior to release to existing wetlands.

### Extensions of Riverine Wetlands

Restoring stream channels filled for agricultural use is a high priority since it improves habitat and hydrologic function. Such restoration will create a more complex edge where the forest and open field meet, providing enhanced wildlife habitat value. Aquatic habitat and riparian corridors will be extended to provide more complex and

diverse habitat value.  Restoring the riparian stream corridor of Pristine Creek will also provide an aquatic and terrestrial habitat connection between the Triangle Forest and forest bordering Mill Creek and its tributaries.

# Monitoring

In natural resources management, monitoring can be defined as the collection and analysis of repeated observations or measurements to evaluate changes in condition and progress toward meeting a management objective. Two types of natural resources monitoring are resource and habitat monitoring. Resource monitoring focuses on an individual species, its population and distribution. Habitat monitoring focuses on plant and animal communities, and the response of the biotic community to management actions.

Resource monitoring is particularly appropriate when there are identified sensitive, threatened or endangered species at a site. The "Natural Resources Inventory Tonquin Geologic Area" by Fishman Environmental Service (2002) conducted for Metro included identification of these species that occur or have the potential to occur in the Wilsonville Tract habitats. While there are a number of federal species of concern identified as potentially occurring on the site, only the northern red-legged frog and willow flycatcher were observed. Of the potential state sensitive and/or vulnerable species that may occur on site, the pileated woodpecker was observed along with the two previously mentioned species. Unless there are species critical to future management concerns (i.e. weed species), it is recommend that resource specific monitoring be a lower priority than habitat monitoring.

The recently completed natural resources inventory is a point-in-time measurement of the resources to characterize conditions. It was not intended as a "baseline" against which future management could be assessed. The inventory utilized the National Vegetation Classification System to characterize plant communities, which is consistent with other Metro inventories throughout the region as well as those conducted by other natural resources management agencies, including The Nature Conservancy, U.S. Bureau of Land Management, etc. The delineation and characterization of plant communities or habitat types on the Wilsonville Tract will assist in developing ecological models and management goals for the area, including selection of indicator species or sensitive attributes.

### Re-Vegetation Monitoring

Considerable re-vegetation activities to establish native plant communities will occur in the area presently being cultivated. Critical to the successful establishment of these native plant communities is the planting and initial maintenance period, which is roughly five or more years. Re-vegetation monitoring should occur both during the planting process, as well as successive years following the initial planting.

During the planting process, monitoring will ensure that planted material meets the contract specifications for number and distribution of species per acre as well as below ground planting quality. A 1% sample of total acreage utilizing randomly distributed 1/100th acre plots is the standard for monitoring re-vegetation implementation.

Yearly monitoring following initial planting should occur every fall for approximately five years. This monitoring process includes identifying the total number of surviving planted trees and shrubs, their overall condition, identifying competition from non-native plants, assessing animal-insect-disease issues, identifying and quantifying numbers of other native plants on the site, and assessing the survivability of seed if site was seeded following treatments. A minimum of five plots per acre utilizing random 1/100th acre plots is the sampling standard for a yearly monitoring.

For monitoring forbs and grasses, percentage cover within plots randomly distributed on established transects will indicate a measure of success.

The yearly monitoring report should also include recommendations for follow-up treatments, if needed, as well as assessing overall site conditions, noting any anomalies or items of interest that are occurring on site.  Informal monitoring of revegetation areas is an ongoing process that occurs on sites during the different seasons. Changes noted on the site need to be immediately addressed (i.e. erosion) or need to be incorporated into ongoing work on the site.

# Appendix B

Stakeholder Advisory Committee (SAC)
Meeting Summaries

**City of Wilsonville**
**Wilsonville Tract Master Plan**
**Stakeholder Advisory Committee Meeting #1**
**August 27, 2002**

## Minutes

Committee Members Present: Mayor Charlotte Lehan, Jane Hart, Bob Carlson, Rick Noonan, Dan Willis, Mary Hinds, Debra Iguchi, John Skidmore, Brian Turner, Patricia Farrell, Sue Sweigert.

City of Wilsonville Staff: Chris Neamtzu, Kerry Rappold

Consultant: Carol Mayer-Reed, Irene Bowers, Krishna Greenwood

**1.0 Purpose of Meeting**

Kick off meeting for the Wilsonville Tract Stakeholder Advisory Committee (SAC).

**2.0 Discussion/Agenda Items**

2.1 Welcome and Team Introduction

SAC members and team did a round of introductions and statement of interest.

2.2 Introduction to the Wilsonville Tract

Mayor Lehan gave an introduction to the history of the Wilsonville Tract property. The site was used by Native Americans as summer travel grounds. Many homesteads made up the Wilsonville Tract Property. Mayor Lehan's family sold their portion of the property to the State of Oregon in 1954 for a state mental health facility.

Earlier potential developments on the site were: women's prison, golf course with club house, National Guard vehicle maintenance facility and the Oregon Garden.

City of Wilsonville convinced DSL to purchase the Wilsonville Tract property. The sale of the property benefited the Common School Fund.

Metro purchased the Wilsonville Tract property from DSL in May of 2001.

The Department of Administrative Services owns the old sewage treatment plant that sits on 15 acres located north of the Tract and would like to sell the property. The plant is in the process of being decommissioned.

The filbert orchard located in the southwest portion of the site was an OSU experimental agricultural project established around 1965.

Fields on the Wilsonville Tract are currently being leased to a local farmer. Any changes to this lease agreement need significant time/notice.
Question of concern: What, if any, chemical application methods are currently being used?

SAC field trips to Willamette Mission, Finley Farm and Lusher Farm were suggested.

**ACTION:** Jane Hart to check with Metro as to the farming and chemical application methods used by the farmer leasing the Wilsonville Tract fields. Mayer/Reed will review the scope/ budget and report to Chris Neamtzu on including SAC field trips.

2.3 Master Planning Process

Scope of work was introduced and discussed with Committee members. Three public open houses will be held as part of the project with the SAC meeting prior to each of these meetings.

**ACTION:** SAC members to review Scope of Work and identify any schedule conflicts or concerns.

2.4 Site Inventory

Mayer/Reed presented the Site Inventory, explaining the current conditions of the site.

2.5 Preliminary Site Issues, Opportunities and Constraints

Mayer/Reed presented the following issues:

a. Water Resources and Management:

The Villebois outfall into Legacy Creek and the impacts it is having on the creek, adjacent banks, vegetation and surrounding area.

Villebois development interested in returning stormwater to its original drainage basins.

b. Plant and Wildlife Resources and Management:

Maintain Oak 'Triangle', located SE of the Learning Enrichment Center, to encourage wildlife habitat.

Opportunities of preservation and restoration of natural resources.

Wetland restoration opportunities to provide wildlife habitats.

Existing agricultural use that provides funds to Metro.

Agricultural methods to encourage biodiversity.

Maintaining open space was seen as a future asset to the community of Wilsonville. Possible meadow preservation/restoration to encourage meadow wildlife and flora.

c. Recreational Opportunities:

Establish a 'Regional Destination' with connections to regional trails.

Passive recreational uses that are compatible with the varying site conditions and the Metro Greenspaces Bond Measure. Agricultural, water filtration and xeriscape demonstration areas, wildlife trails, interpretive trails and educational opportunities through hands-on experiences.

Facilities to provide parking, access and shelter.

d. Circulation and Connections:

Connectivity to the surrounding residential areas and future Villebois development is important.

How this connectivity is to be achieved will be discussed in further detail at a later time.

**ACTION:** Mayer/Reed to check with Metro to determine what restrictions the Bond Measure imposes on the Tract property.

2.6 Preliminary Goals and Objectives

Preliminary goals and objectives were discussed with many ideas generated without any definitive consensus reached. The following have been grouped for recording purposes only:

Water Resources and Management:

Decommission Dammasch outfall at Legacy Creek.

Restoration of Legacy Creek from damage caused by Dammasch outfall.

Restoration of Mill Creek and its tributaries.

Plant and Wildlife Resources and Management:

Preserve and restore natural resources.

Establish compatible uses that are sustainable.

Establish agricultural management while incorporating a trail system.

Restrict access during restoration.
Enlarge and restore wetland.
Establish wildlife recovery program.
Maintain open meadow space.
Maintain views to mountain range.
Reestablish forest for wildlife.
Establish different wetland types.
Establish ecological diversity.

Recreational/Educational Opportunities:

Establish site as a 'regional destination'.
Utilize school.
Establish pedestrian, biking and horse trails with restrictions.
Become a linkage in regional trails system.
Provide multiple access points.
Provide educational opportunities for students and visitors.
Establish site as an outdoor 'lab'.
Establish CREST as the interpretive center.
Provide shared parking with surrounding developments (CREST, Villebois).
Provide shelters.
Encourage partnerships with community, surrounding landowners, public agencies and non-profit organizations.

Circulation and Connections:

Provide connectivity while balancing wildlife needs.
Establish a connection from Villebois to Middle School/Elementary School.
Provide pedestrian/bike access.
No paved roads through site.

2.7 The meeting adjourned. Some members expressed conflicts with the next meeting day.

**ACTION:** Mayer/Reed to review possible change of SAC meeting to Mondays and distribute calendar.

END

**City of Wilsonville**
**Wilsonville Tract Master Plan**
**Stakeholder Advisory Committee Meeting #2**
**October 21, 2002**

## Minutes

Committee Members Present: Jim Morgan, Jane Hart, Bob Carlson, Dan Willis, Mary Hinds, Debra Iguchi, Howard Busse, Jim O'Connell, Jacquie Gertz,

City of Wilsonville Staff: Chris Neamtzu, Kerry Rappold

Consultant: Irene Bowers, Krishna Greenwood

**1.0 Purpose of Meeting**

Public Open House update and review of preliminary design concepts.

**2.0 Discussion/Agenda Items**

2.1 Welcome and Introductions
SAC members and team introductions

2.2 Metro Regional Perspective - Jim Morgan gave an overview of the historic background of the Wilsonville Tract property.

- The Wilsonville Tract property lies to the south of the Tonquin Scablands and was formed when floodwaters scoured the earth out and deposited the fines in the Wilsonville Tract and surrounding area before entering the Willamette River.

- Metro uses GIS data taken from varying sources including the 1851 donation land claim survey to demonstrate the historic plant communities that are found throughout the Wilsonville Tract property.

- According to the historic data, the Coffee Lake area used to contain wetlands, fir, pine and oak savannah. Oak savannah typically consists of oak trees, understory shrubs and grasses. These plant communities are becoming very rare.

- Current invasive plant management has taken place in the form of volunteer efforts and experimental goat feeding weed control. Evidence of the effectiveness of the goat feeding weed control efforts can be seen on the south edge of the conifer forest area adjacent to the experimental filbert orchard.

- Trail connections to other Metro owned properties are important and future conceptual trails are being considered. One such trail connection is the planned trail to connect Wilsonville Tract to the Tualatin River National Wildlife Refuge. There are several obstacles to overcome such as land ownership restrictions.

2.3 Jane Hart had been asked by the city to address the issue of dog and horse use on the Tract.

- Horse usage may not be compatible due to the relatively small size (in acreage) of the tract. Horse activity is typically separated away from main activities and sensitive areas. There are examples of multi-use horse sites such as Oxbow Park and the Springwater Corridor.

- Jane also addressed the issue of dog use of the site. Generally Metro takes a 'no dogs allowed' approach due to the possible contamination to the waterways from

dog fecal matter and the bacteria often found within. Dogs have also been found to become instinctively more aggressive when exposed to natural areas, which can lead to aggressive behavior towards the existing wildlife. This activity can cause existing wildlife to leave the area and thus change the wildlife habitat.

- Jim O'Connell added that there have been studies on the potential of E. Coli contamination from horse fecal matter.

2.4 Overview of Public Open House #1
Kerry Rappold gave a brief overview of the organization of the first public open house and briefed the SAC members that no new Goals and Objectives were added to the SAC list.

2.5 Review of Comments from the Public Open House #1
Copies of the written questions and comments memo prepared by Mayer/Reed were distributed to the SAC members.

2.6 Review of Goals and Objectives
Irene Bowers led a review of the Goals and Objectives and presented the comments from the Public Open House #1.

2.7 Presentation / Discussion of Preliminary Design Concepts
Mayer/Reed presented Scheme #1 - Successional Recovery and Scheme #2 - Educational/Interpretive.

Scheme 1 is based on the concept that ecological and wildlife habitat recovery of the site is the first and foremost purpose of the open space. Human use consists of a trail network and minimal facilities to support the limited pedestrian/bike/equestrian use. Existing farming operations would be phased out over time and former watersheds would be restored. Coniferous climax forest, oak forests and wetlands would extend into meadow open space through a successional ecological program. This concept builds on the diverse ecotypes and remnant forests that already exist on site. Specific areas of restoration, such as Legacy Creek, would be a top priority for recovery and restoration.

A pathway system would connect the site to off-site entry points and to a series of loop trails that provide access internally. The trail system would have a hierarchy of uses, widths and levels of improvement. A 12' wide paved trail that accommodate pedestrians and bikes would link the schools, CREST, Villebois and a new trailhead (with parking) located along Wilsonville Road. This paved path would also accommodate the occasional fire, safety and maintenance vehicles. A series of secondary soft surface trails would branch off from the main trail to access the more sensitive ecological parts of the site. These trails would be best suited for pedestrians only. Portions could be ADA accessible, except where grades become excessive. Separate bridle trails, if desired, would be located within the open space. A trail connection to the Willamette River is identified for future consideration.

Picnic shelters and restrooms would be located on the north and south sides of the site, one near the Wilsonville trailhead and one near the Villebois entry. Wildlife viewing blinds can be located along the trails.

Interpretive information would focus on stories and demonstrations of site recovery. Information would describe the landscape and its components as an evolutionary and dynamic process. History of the site

would be described so that changes that have taken place over time create an understanding of past use, yet build on the values and need for site recovery. Interpretive opportunities exist at the entries of the pathway system and along the trail at key locations.

Scheme 2 - One interesting aspect of the Wilsonville Tract site is its close proximity and relationship to the schools and CREST. While site recovery, as described above, is still an important aspect of the scheme, this scheme offers an extended role for the Wilsonville Tract as a site of public education and attraction in the region. The existing open space becomes a location and gathering space for outdoor programs, events and community celebrations that support the overall notion of ecology in balance with human activity and interests.

The freestanding Oregon oak growing in the open space on the Tract becomes the heart of the site and focal point for this concept. An interpretive "timeline" in the form of a series of earthworks will connect CREST to the oak tree location. Trailheads would have connecting pathways to this central feature.

A small observation mound at CREST begins the interpretive journey. Through a series of constructed earthworks, park visitors will become engaged with geological, ecological and cultural stories that are relevant to this site. Topics would include natural and human forces that have played an important role in the formation the Willamette Valley, the local region, City of Wilsonville and this site in particular.

The sequence of earthworks leads toward the oak. Each individual earthwork site focuses on and portrays the different topics of geological, ecological and cultural information. The oak site will be the cultural center for community and classroom activities. Low stonewalls for seating and space for events are envisioned for this location.

The pathway system, while similar to the concept above, will connect directly to the oak space, with secondary trails connecting the rest of the site. Ecological restoration will still occur, as outlined in Scheme 1, becoming the backdrop for the larger interpretive stage that the site offers.

Agricultural field operations would be phased out over time, when site development begins to limit the cost effectiveness of the diminishing size of acreage available. The filbert orchard, however, would be interplanted or even extended with new disease-resistant strains of hazelnut trees. Agriculture would be an important topic for the cultural interpretive stories, along with information about Native American use of the site (burning) and early settlement pattern effects on this site (clearing, contouring, farming).

**SAC Comments:**
Jim O'Connell would like to see an access to the SWRP (Student Watershed Research Project) testing area along Mill Creek from the Legacy Creek intersection to the Mill Creek culvert crossing under Bell Road. The SWRP groups have been taking samples from these waterways for the past ten years. They need trail access to the water's edge and roadside bus parking. Jim also mentioned that his class would like to be involved in any volunteer trail construction efforts.

Concern was raised with parking being located to the west of the filbert orchard due to restricted sightlines because of the topography of Wilsonville road to the West. The SAC committee felt that it would create a hazardous traffic pattern.

Jim Morgan expressed interest in seeing shared parking at CREST, Boones Ferry Primary and Wood Middle School in order to save more natural resource area and for security reasons.

Some members would like to see the filbert orchard looked at as a potential parking/picnic area. While others brought up the question, "Why keep the filbert orchard?"

If there is no additional parking at or near the trailhead then there needs to be service access to the trailhead for maintenance.

Mary Hinds expressed concern over the separation of the ecological interpretive earthwork and the cultural interpretive earthworks in Scheme #2. She felt that there is an unnecessary separation between the two and that Native Americans dictated what the ecologic development was and therefore the two earthwork areas overlap.

Establishing the Oak as the "heart" or center of the site was favored as a good site feature. There was concern over the use of earthworks to establish the Oak as the "heart" or center, due to possible damage that could occur to the tree. The other earthworks were seen as not being needed. The committee felt that the interpretive aspect could be achieved throughout the site along the trail system.

Other general comments included:

- Keep trails out of sensitive areas.
- Realign the trail to the south of Legacy Creek and up around the east side of the Dammish out fall.
- Have as few trails as possible.
- Do not cross streams, if it can be avoided.
- Establish overlooks along trail with interpretive signs. This will allow people to view the waterways and keep trails out of sensitive areas.
- The Living Enrichment Center would like to see a pedestrian connection to the east of their facility. Trail connection would need to include restricted access signage.

2.8 Discussion on possible new names for the Wilsonville Tract open space/park.

Mary Hinds suggested that since this is a Metro owned property that perhaps Metro would want to hold a naming contest. Another suggestion was a contest among local school-aged children.

The following names were mentioned for consideration:

Lone Oak Park
Wilsonville View
Mill Creek Park
Vista View Park
Lehan/Young Park
Legacy Park
Heritage Oak Park
Pristine Creek Natural Area

Debra Iguchi mentioned the idea of research into the maiden names of the settler's wives. The name being from one of the historic female figures/landowners of the area.

2.9 Public Open House #2 Announcement
Public Open House #2 will be Wednesday October 30,2002 from 6:00-9:00 p.m. with a 6:15 p.m. presentation at the City Hall Annex located at 8445 SW Elligsen Road.

2.10 Closing Remarks
Chris Neamtzu expressed his thanks for the committee members' participation and encouraged all members to attend the Public Open House #2.

END

**City of Wilsonville**
**Wilsonville Tract Master Plan**
**Stakeholder Advisory Committee Meeting #3**
**December 9, 2002**

## Minutes

Committee Members Present: Jim Morgan, Jane Hart, Deb Scrivens, Bob Carlson, Dan Willis, Mary Hinds, John van Staveren,

City of Wilsonville Staff: Chris Neamtzu, Kerry Rappold, Maggie Collins

Consultant: Carol Mayer-Reed, Krishna Greenwood, Mirth Walker

**1.0 Purpose of Meeting**

SAC members update and review of Concept Master Plan.

**2.0 Discussion/Agenda Items**

2.1 Welcome and Introductions

SAC members and team introductions.

2.2 Review Public Meeting #2

Carol Mayer-Reed gave an overview of the three concept plans that were presented at the Public Open House #2.

Deb Scrivens raised a concern over bus parking being provided for in the proposed parking lot. Chris Neamtzu pointed out that existing bus parking is provided at both Boones Ferry Primary and Wood Middle Schools.

2.3 Review Finley National Wildlife Refuge Site Visit

Chris Neamtzu and Carol Mayer-Reed gave a review of the information that they collected while at the Finley National Wildlife Refuge.

Finley National Wildlife Refuge is using oak savannah/woodland revitalization to encourage establishment of wildlife habitats. Finley is also using crop management to provide wintering habitat for Dusky Canada geese. The Dusky Canadian geese are highly sensitive to human disturbances and therefore need an area free of human disturbance.

Flooding techniques are being used to control reedcanary grass in the waterways.

Due to the significant loss of the Willamette Valley's oak savannahs, Finley Wildlife Refuge is currently working to re-establish an oak savannah ecosystem. Douglas fir is removed in some areas of the refuge to accelerate the reestablishment of oak savannah/woodland.

The Willamette Mission State Park, located north of Salem, is another example of crop management to encourage wildlife habitat.

Patricia Ferrel informed the SAC members of the future removal of the established blue bird habitat boxes due to the Villibois development.

The SAC members agreed that re-establishment of the blue bird boxes being disturbed by the Villebois development would be beneficial to the Wilsonville Tract, but primary management for a single species due to the acreage and potential pedestrian use would not be attainable.

Mirth Walker brought to our attention the sighting of cougar on the Wilsonville Tract property. Her

recommendation in managing the cougar and other roaming animals is to protect the ingress/egress of the site so that these animals can maintain their paths of movement.

2.4 Oak Habitat

Jim Morgan of Metro gave a presentation on the historic vegetation of the Wilsonville Tract and the importance of oak habitats.

Metro uses GIS data and data taken from historic surveys dating back to the 1800s to track the historic vegetations of their properties. According to the historic data the forested areas of the Wilsonville Tract consisted of oak savannah and riparian forest. Oregon white oak, Ponderosa pine and Douglas fir were the primary tree species with snowberry and Oregon grape as the primary understory plants. There were also indications of forbs and native grasses as understory plantings in the open meadows.

GIS data is also used to determine soil types, which can then lead to more appropriate plant selection per soil type.

Metro has used prescribed burns as a management tool to meet maintenance goals. Prescribed burning is very effective in controlling forbes and grasses but this method is difficult to use in close-in urban areas. Prescribed burns should be done on a 2-3 year cycle and should be done in the fall season after 1 or 2 good rains. Waiting until after the first or second rain allows the large fuels (canopy plant materials) to become saturated while the small fuels (under story plant materials) have ample time to dry out. This allows the small fuels to be burnt without damaging the larger fuels or causing too hot a fire.

There are other maintenance methods that can be utilized such as frequent mowing and animal grazing but prescribed burns provide more educational value and are a true representation of historic conditions.

It was the recommendation of Metro to focus on restoring general habitat types according to the historic conditions and also the need to reestablish regionally significant habitats.

2.5 Presentation / Discussion of the Concept Master Plan by Mayer/Reed.

The Concept Master Plan is based on the concept that ecological and wildlife habitat recovery of the site is the first and foremost purpose of the open space. Pedestrian use consists of a trail network and minimal facilities to support the limited pedestrian use. Existing farming operations would be phased out over time and altered habitats would be restored. Coniferous forest, oak forests and wetlands would extend into meadow open space through successional plantings. An oak savannah would be established in portions of the meadow open space, creating an open habitat. Specific areas of restoration, such as Legacy Creek, would be a top priority for recovery and restoration.

A pedestrian trail system would connect the site to off-site entry points and to a primary and secondary loop trails system that provide access internally. The trail system would have a hierarchy of uses, widths and levels of improvement. A 12' wide paved trail to accommodate pedestrians and bikes would link the schools, CREST, Villebois and a new trailhead (with

parking) located along Wilsonville Road. This paved path would also accommodate the occasional fire, safety, and maintenance vehicles. A series of secondary soft surface trails would branch off from the main trail to access the more sensitive ecological parts of the site. These trails would be best suited for pedestrians only. Portions of the trail system could be ADA accessible, except where grades become excessive.

Picnic shelters and restrooms would be located on the north and south sides of the site, one near the Wilsonville trailhead and one near the Villebois west entry. Wildlife viewing blinds could be located along the trails with Mount Hood viewing points.

**SAC Comments:**
Concern was raised over the open meadow patch located to the west of the existing filbert orchard. The concern was the proposed expansion of the forested area and the creation of an open meadow space that is too isolated. SAC members were concerned that this isolation may cause a security problem. The SAC members agreed that it would be best to reestablish this area with successional plantings. This would not only eliminate the security issue, but will also create a wider forested neck for wildlife crossing of Wilsonville Road.

Kerry Rappold suggested that the northern picnic shelter be moved closer to the trail.

Metro suggested a fence at the property's edge along the east property line between the existing houses and the proposed paved trail. SAC members agreed that a fence might be necessary to define the property line, provide security to trail users and to eliminate neighbor encroachment. SAC members agreed that this is an issue, but that the fence should not be shown on the Master Concept Plan at this time.

It was also suggested that buffer plantings be installed along the property fence to provide a buffer between the proposed trail and the private residences.

2.6 Policy on dogs and horses in Wilsonville Tract - Mayer/Reed led the SAC members in a discussion on Metro's dog and horse policies and how to apply those policies to the Wilsonville Tract.

Deb Scrivens stated that dogs create a greater conflict with the habitat than horses because dogs leave a predator scent, which disrupts the existing wildlife in the area. Horses do not leave a predator scent and therefore create only a mild conflict with the habitat. However, horses create a greater impact on pedestrians, and potentially water quality (i.e. trail erosion, animal waste).

Other general comments included:

- Limit dog walking to paved and boardwalk trail.
- Provide a fenced-in area to be designated as a dog run.
- The Wilsonville Tract should be viewed as a resource management property. To allow dogs is contradictory to the project goals and objectives.
- Need regulatory signage for mountain bikes due to the potential threat of erosion.

2.7 Naming opportunities for the Tract - Topic to be discussed at SAC Meeting #4.

2.8 Summary

SAC members agreed that the Concept Master Plan needs to be presented as a wildlife/resource master plan.

Chris Neamtzu expressed his thanks for the committee members' participation and reminded all members of the upcoming SAC meeting on January 6, 2003 and of the Public Open House on January 22, 2003.

END

**City of Wilsonville**
**Wilsonville Tract Master Plan**
**Stakeholder Advisory Committee Meeting #4**
**January 6, 2003**

## Minutes

Committee Members Present: Jim Morgan, Jane Hart, Dan Willis, Mary Hinds, John van Staveren,

City of Wilsonville Staff: Chris Neamtzu, Kerry Rappold, Maggie Collins

Consultant: Carol Mayer-Reed, Krishna Greenwood, Mirth Walker

**1.0 Purpose of Meeting**

SAC members update and review of Concept Master Plan.

**2.0 Discussion/Agenda Items**

2.1 Welcome and Introductions

SAC members and team introductions.

2.2 Present Concept Master Plan

Carol Mayer-Reed gave an overview of the Concept Master Plan that was presented at the Stakeholder Advisory Committee Meeting #3.

The Concept Master Plan focuses on natural resources restoration and enhancement, and working with the existing natural resources to enhance and rehabilitate those resources. The Master Plan proposes to establish an Oregon white oak savannah in the central portion of the site, creating an open habitat. The existing farming efforts will remain until sufficient funds have been acquired to implement the restoration, at which time the farming efforts will be phased out over time. The Master Plan will include a Natural Resources Management Plan, which will describe the site conditions and maintenance practices to be used to maintain the natural areas and to encourage further natural resource development. Rvegetation efforts could begin at the existing forest edge and extend out into the meadow open space through successional plantings. The Master Plan concepts will work to provide diverse habitats while maintaining open space.

A primary 8'-12' wide paved shared bike/pedestrian trail will connect the parking and picnic facilities at the south entry, the Boones Ferry Primary School, Wood Middle School, CREST, the picnic shelter and trailhead to the Villebois master planning area at the north entry. This primary paved trail will also provide a phased trail to make a connection west along Wilsonville Road to eventually reach the Willamette River. A secondary gravel trail will connect into the primary trail creating a looped system. This secondary trail will be ADA accessible as will the primary trail. Tertiary soft surface foot paths will allow for pedestrian-only uses in the wooded areas and will allow for access to the existing water testing sites currently being used by the local high school science students and CREST volunteers.

2.3 Discussion of Concept Plan - Carol Mayer-Reed led the discussion.

John van Staveren questioned the proposal made by the Villebois Development of a road bisecting the Wilsonville Tract. Chris Neamtzu referred the SAC members and John to the Metro letter stating it would be very difficult for Metro to support the road due to the Bond Measure

language and intended uses as specified in the bond measure as well as the Metro easement policy. It was agreed that the Wilsonville Tract Master Plan would not recommend the road development.

Concern was expressed towards the meadow open space to the west of the filbert orchard. Some SAC members felt it might pose a safety issue due to its location in relation to the active areas. There was concern that policing of this area would be difficult and could pose a potential problem. Mirth Walker recommended using this area as a nursery stock/staging area during construction and then using successional plantings to close the space in. Mary Hinds recommended keeping the meadow open for falcon species, which are currently using the meadow and the existing forest edge as a feeding ground. No decision was made.

Mary Hinds raised the issue of erosion at the west edge of the meadow open space located west of the filbert orchard.

**Action:** Mayer/Reed agreed to look at the existing slopes and conditions, and make recommendations to prevent further erosion.

SAC members agreed that the trail system should be low-key and the trails should be as narrow as possible. Mirth Walker asked about the proposed trail along Wilsonville Road and if easements exist that will allow for this trail construction. Carol Mayer-Reed stated that this trail would be shown on the plan as future development. SAC members agreed that all trails need to be classified for non-motorized uses and that mountain bikes be allowed on paved trails only. SAC members also agreed that a clear set of rules and regulations need to be established and posted at trailheads.

**Action:** Mayer/Reed will graphically revise the trail running from the parking area along Wilsonville Road to the southern edge of the site. This section of trail will be labeled as 'Phased trail connection to Willamette River'.

Mary Hinds inquired if the master plan is proposing a trail connection to the Park at Merryfield. Chris Neamtzu explained that the master plan calls for a pedestrian access at the Wilsonville Tract property line adjacent to the Park at Merryfield. There are plans (not included in the Wilsonville Tract Master Plan) for a trail connection from the proposed pedestrian access to the existing pedestrian trail on the east and south edges of the park.

Chris Neamtzu addressed the parking issue to the north of the tract property. According to the meeting held with representatives from the Villebois Development, the Villebois Master Plan is proposing on-street parking that can be utilized by Wilsonville Tract visitors wishing to access the site via the north pedestrian access.

Jim Morgan asked if the Villebois Development had a stormwater management plan. Chris referred Jim to the Villebois Village Plan that was issued to the city. Carol Mayer-Reed informed the SAC members of a few of the issues regarding stormwater as discussed at the meeting with representatives from Villebois. Villebois will not have more water runoff than currently exists. Villebois developers will be redirecting the water into the original three historic watersheds. John van Staveren informed the SAC members that Villebois is currently looking into additional stormwater management issues.

Carol Mayer-Reed and Chris Neamtzu gave a brief summary of the information presented by Deb Scrivens at the previous SAC meeting regarding the effects of dog and horse presence in natural resource areas.

Mary Hinds stated that she currently takes her dog to the Wilsonville Tract. Since she has been frequenting the Tract, she has never seen a dog off-leash that was with an owner. Mary suggested keeping designated dog areas in the level portions of the property. She was open to having the paved trail as a designated dog-on-leash area.

From a natural resource perspective, Mirth Walker suggested that we should use existing developed areas for dogs and limit dogs as much as possible to safeguard the natural resources.

Dan Willis, not a dog owner, feels that we need to allow dogs on the paved trails to allow for a pass-through zone across the Tract. He feels that horses do not belong due to the potential increase in erosion, damage and incompatibility.

Kerry Rappold added that he feels that horses are not compatible with the Tract's intended uses and goals and objectives.

2.4 Naming opportunities for the Tract/Concept Master Plan Discussion Continues.

Carol Mayer-Reed started the discussion by expressing her concern over naming the Tract as a "park," versus an open space or natural area. She went on to say that naming the Tract as a "park" would suggest active uses rather than passive uses. This could lead to a misperception on the part of the public. Carol felt that naming the Tract as an open space or natural area will give a sense of natural resource importance, which directly corresponds to our project goals and objectives.

Jim Morgan agreed with Carol by reiterating that the Wilsonville Tract property was purchased with funds set aside for the Open Space Bond Measure. The Open Space Bond Measure funds are a separate fund than the parks funds and therefore, Jim feels that it is important to make the public aware of the intended use according to the Bond Measure.

SAC members agreed that the naming of the Tract will set up expectations in the minds of the public for intended uses and that the naming of the Tract needs to reflect the intended uses.

Mary Hinds suggested providing a transition zone at the edges of the Tract property for the public to transition from the 'park' area or 'active space' to the 'natural' areas or 'passive space'. The transition zone allows visitors to access the picnic shelter, restrooms and open spaces at the edge of the site then move across the site to experience the natural areas.

Carol Mayer-Reed brought up another aspect to the dog issue. Dog walkers tend to act as natural police by just being there.

Kerry Rappold asked, how do we accommodate horses and horse trailers onsite if we allow horseback riding?
Chris Neamtzu informed the SAC members that Memorial Park had equestrian facilities and designated horseback riding trails. The Wilsonville Parks Department demolished

the horse facilities due to much needed park improvements. There was no public concern towards the demolition. SAC members agreed on a "no horse" policy for the Wilsonville Tract on the basis of an increased potential for erosion and damage to the natural resource areas, the limited size of the property and the conflicts that could arise between pedestrians and animals. SAC members agreed that allowing horses would conflict with the goals and objectives for the project as set up by the SAC.

An additional review of the trail system brought about the relocation of the viewing blinds from the main trail to the secondary trail system. There was also a recommendation by Mirth Walker that the master plan state that all trail alignments shall be field verified prior to construction.

**Action:** Mayer/Reed will revise the location of the viewing blinds and will indicate in the master plan report that all trails are to be field verified prior to construction.

Jim Morgan advised the SAC members to weigh the Tract uses and adjust accordingly. He suggested that if the committee agrees to allow dogs, then perhaps dog areas need to be kept away from the natural resource areas.

Maggie Collins suggested revisiting the plan and ideas on a yearly basis as the surroundings change and evolve.

Mary Hinds stated that she wishes she had seen the Bond Measure language in order to better understand what was intended for the site. She also thought the label 'Successional Deciduous Forest Re-Vegetation' was confusing and misleading. She would like to see the word 'deciduous' dropped from the label. The SAC members agreed.

**Action:** Mayer/Reed will revise the label on the plan to read "Successional Forest Re-Vegetation".

Mirth Walker referred Mary Hinds to the historic survey of 1852 to explain the types of successional re-vegetation that the design team will be recommending. Mirth recommended that the design team use the soils map to determine suitable plant species for the site when making plant recommendations.

Dan Willis posed this question to Mary Hinds - "What would you like to see in the transition zone at the edges of the Tract property?" Mary answered by saying that she would like to see shorter trails, picnic areas and a trail for disabled and the elderly who have trouble walking.

After a brief discussion, the SAC members agreed that the trail alignment was a good compromise with the addition of a connector trail from the CREST pedestrian access down to the sidewalk along Wilsonville Road and back up to the parking and picnic area, creating a shorter ADA accessible paved loop.

**Action:** Mayer/Reed will revise plan to show the new trail connection.

Revisiting the "no dog" policy, Carol Mayer-Reed felt that there needed to be a definitive yes or no decision by the SAC members in order to present the policy to the public at the next open house.

After a brief discussion, the SAC committee was still divided on whether to adopt the "no dog" policy.

Chris Neamtzu recommended that a poll be taken among absent SAC members via email to get opinions on the "no dog" policy. This will allow SAC members to make a more conclusive decision.

Suggestions were taken from SAC members and from the public at the Public Open House #2 for possible names for the Wilsonville Tract.

The following is a list of those suggestions:

- Lone Oak Park
- Wilsonville View
- Mill Creek Park
- Vista View
- Legacy Park
- Bell Creek Park
- Oak View Park
- Legacy Oak Park
- Wilsonville Woodlands
- Wilsonville Woods
- Pristine Creek Natural Area

2.5 Summary and Open House Invitation

Chris Neamtzu expressed his thanks for the committee members' participation and reminded all members of the upcoming Public Meeting on January 22, 2003 to be held at the City Annex, located at 8445 SW Elligsen Road, Wilsonville, Oregon 97070. The public meeting will begin at 6:00 p.m. with a presentation at 6:15 p.m.

END

# Appendix C

Public Open House Summaries

Park at Merryfield Neighborhood Association Meeting Summaries

**City of Wilsonville**
**Wilsonville Tract Master Plan**
**Open House #1**
**October 1, 2002**

## Agenda

### Introduction (15 minutes):

- Welcome and introductions.
  Mayor Lehan, Chris Neamtzu, Metro Staff
- The master planning process.
  Carol Mayer-Reed
- The public involvement process. What to do tonight.
  Chris Neamtzu
- Project goals and objectives.
  Carol Mayer-Reed, Kerry Rappold
- Description of project materials and resources.
  Carol Mayer-Reed

### Open House Format

Project materials will include inventories, studies and site analysis, which will be displayed throughout the room. Stations will be set up to host both questions and feedback from the public regarding the specific content displayed at each station.

Station #1 - Introduction:

- Sign-In / Name Tags / Agendas / Project Schedules
- Comment Cards - Fill out or mail in
- Final Thoughts

Station #2 - Project Information:

- Project Introduction
- Project Schedule
- Metro Bond Measure Language
- Project Goals and Objectives
- Questions and Comments

Station #3 - Regional Context:

- Map of Willamette Valley
- Metro Open Spaces, Parks and Trails Regional Target Areas
- Air Photo
- Site Context
- Questions and Comments

Station #4 - Site Features:

- Site Linkages
- Slope Analysis / Sensitive Areas
- Site Opportunities and Constraints
- Questions and Comments

Station #5 - Site Resources:

- Photo Board
- Wildlife Habitat and Vegetation
- Questions and Comments

END

**City of Wilsonville**
**Wilsonville Tract Master/Management Plan**
**Open House #1**
**October 1, 2002**

## Summary of Input

### Station #1
### Introduction

### Station #2
### Project Information

Preliminary Goals and Objectives:

1. Preserve the natural features of the Wilsonville Tract.
   - Without causing harm to existing neighborhoods, i.e. restore natural wetlands in a way that does not cause excess water to flood existing homes.
2. Restore and enhance existing natural resources for ecological diversity.
   - Yes, plan to end agricultural use and restore a broad range of native vegetation, including open meadows and grasslands.
3. Establish site as a regional destination.
4. Plan for trail connections to the Wilsonville Tract.
   - Specifically link horse, pedestrian and cyclist trails to the Villebois development.
   - Link to City of Wilsonville bike and pedestrian trails.
   - Consider linkages to the river front trail on the flood bench per Wilsonville Westside Master Plan.
   - Could be like the Sherwood trail system.
   - Would like to see low impact trails, no horses or land specific areas for bikes.
5. Protect natural areas while providing appropriate passive recreation opportunities such as trails.
   - Consider overlook platforms above the wetlands to view bird life, especially during the wet seasons.
6. Comply with the Metro Greenspaces Bond Measure regarding appropriate recreation activities on the property.
   - Do not put a road through the Wilsonville Tract property.
   - Bike paths would enhance bike system.
7. Provide the necessary supporting elements for trail usage.
   - Photo of parking lot and trail access from all sides.
   - Picnic tables with shelters at a couple points on the perimeter.
   - Shelters would encourage 'all season' usage.
   - Picnic or resting benches made to blend into the environment.
   - Parking lots should be on the outer borders, near schools and CREST where paving is already started.
8. Provide interpretive information, educational programs, and opportunities.
   - Demonstrations of xeri-scaping, water filtration with plants, miniature ecosystems as close to CREST as possible.
   - For schools and City of Wilsonville programs.
9. Provide a pedestrian and bicycle connection through the property from Villebois development to the middle and elementary schools.
   - Provide pedestrian and bicycle connections to city-wide trail system.

- Make connections to river and existing trails at Morey's Landing and the Water Treatment Plant.
- Biking and hiking okay, but no road through it.

**Station #2**

## Project Information

Questions and Comments

1. How often do you visit the Wilsonville Tract?
   a. Once a week or more. (2)
   b. Once a month or more. (1)
   c. Once every few months. (0)
   d. Less than twice a year. (1)
2. How often do you anticipate visiting the Wilsonville Tract?
   a. Once a week or more. (3)
   b. Once a month or more. (0)
   c. Once every few months. (1)
   d. Less than twice a year. (0)
3. Why do you visit the Wilsonville Tract? (eg. hiking, biking, walking pets, reading, etc.)
   - Hiking and walking pets.
   - Hiking, tai chi, vistas, meditation, ceremonies, removing invasive vegetation, blackberry picking.
   - Walking, bird watching and photography of sunset over the trees to the west.
4. Would you bring friends from out of town to the Wilsonville Tract to give them a flavor of the Willamette Valley's native Landscape?
   - No, no place to park. Need multiple access/parking from the north, south and east at least.
   - Yes, I can walk there.
   - Yes, I have done so for the past 8-10 years.
   - Yes.
5. What are your top three goals for the Wilsonville Tract?
   - Preserve the natural features.
   - Restore natural resources removed for farming.
   - Trails for hiking.
   - Preserve the natural features of the Wilsonville Tract.
   - Plan for trail connections to the Wilsonville Tract.
   - Provide a pedestrian and bicycle connection through the property from the Villebois development to the middle and elementary schools.
   - Protect natural areas while providing appropriate passive recreation opportunities such as trails.
   - Restore and enhance existing natural resources for ecological diversity.
   - Provide the necessary supporting elements for trail usage.
6. What is your vision for the Wilsonville Tract?
   - Forest Park-like trails.
   - Education on eco-systems.
   - Restore vegetation like oaks and fir.
   - Natural landscape to view and enjoy.
   - No ball fields.
   - Multiple trails connecting and crossing a diverse set of different landscapes.
   - Connect agricultural fields to Willamette's historical open meadows.
   - Picnic tables and shelters at perimeter, perhaps on Wilsonville Road side.
   - Place for scout activities, merit badges (including environmental science, etc.)

**Station #3**

## Regional Context

Questions and Comments:

1. Would you be interested in seeing interpretive information on regional natural history including geology at the site?
   - Yes, like the one west of I-5 at Scio (wetland observation of Pacific flyway for waterfowl).
   - Yes, great idea.
2. Is a linkage to Metro's regional trails important?
   - Yes, it would be nice.
   - Pedestrian, horse, and cycling links to Villebois, Hunter Creek and Ladd Hill/Bell Road.
   - Yes.
3. Would you like a connection to the Willamette River?
   - Yes.
   - Yes. Trails, pedestrian, cycling, horse trail links into Hunter Creek and uphill to trails along Ladd Hill/Bell Road.
4. Should this site be a local or regional destination?
   - Yes.

Additional Comments:

- Story-telling provides meaning to features on and off site.
- Community members who have personal history onsite should have the opportunity to share their stories.
- Establish site as a place for story-telling about natural features, the City of Wilsonville, adjacent properties and their past uses.

Suggested Uses:

- Hiking trails
- Interpretive stations
- Kite flying, gliders (saw someone flying a model glider last weekend - silent, good use of open space)
- Restoration activities
- Ceremonies (Earth Day, Equinox,etc.)
- Nature walks (day or night)
- Picnicking
- Contemplation
- Bird watching
- Stream/wetland exploration

**Station #4**

## Site Features

Questions and Comments

1. What would be your preferred mode of transportation to access the Wilsonville Tract?
   - Auto and SMART bus.
2. What type of community events and gatherings do you feel may be appropriate for the site to accommodate from time to time?
   - Natural habitat art events and activities.
   - Building workshops
   - Structures made out of natural materials along trails.
   - Observation deck by wetland area for migrating duck viewing.
   - Celebratory events utilizing drama, movement and music activities connected with the natural environment.
   - CREST is the place for community events, but needs more parking.
3. Do you feel that the current agricultural practices on site

are compatible with public access and use? (Filbert orchard and grass production fields)

- No, farm is way too big.
- There should be more trees in the farm fields.
- Filbert orchard should not be sprayed or fertilized. How come there is no grass around the trees?
- Yes.

4. What natural resources or site features are important to you?
   - Concern about introducing more water to the Arrowhead Creek due to the potential of flooding like in 1996.
   - Any white oak and big leaf maple.
   - Forest remnants, creeks, and wetlands.

5. What public facilities should be provided on this site?
   - Environmentally friendly restrooms like those at the Environmental Learning Center on the Clackamas Community College campus.
   - Waterless, environmentally friendly restrooms.
   - Picnic tables, shade, parking, trail access on perimeter only (where building and development is).

**Station #5**

## Site Resources

Questions and Comments

1. Would you be willing to volunteer to help remove invasive species and restore native plants to this site? If so, please sign below.
   - Yes.
2. What type of opportunities do you think there are for school-aged children to learn about environmental science on the site?
   - Too many to name
3. Would you be interested in seeing interpretative information regarding natural resources on site?
   - Yes.
   - What about a perimeter trail skirting sensitive areas on the west and boardwalks across Arrowhead Creek Wetlands?
4. What role does the CREST play in relation to this site?
   - Central study, research and public education site a must!
   - Access to interpretation of site - staging area.
   - Mini eco-systems (6 foot sq.) and demonstrations, wildlife visits.
   - Leading 'nature art' discovery hikes and nature art workshops with elementary school age children and their families.
5. Do you feel that site restoration, stream enhancement/restoration/preservation, and fish & wildlife habitat enhancement are important?
   - Yes, maintain and enhance wetland and waterways as well as protect wildlife habitat - roads are a potential problem!
   - Yes, restoration and wildlife habitat are my top priorities.
   - Yes!

Additional Questions and Comments

- What is the future of the Seely Ditch?
- Will the Seely Ditch get filled in or restored as a lake?
- What about horse trails?
- Coordinate with Villebois to discuss potential road access to schools.

END

**City of Wilsonville**
**Wilsonville Tract Master/Management Plan**
**Open House #2**
**October 30, 2002**

## Agenda

### Introduction:

- Welcome and introductions
  Chris Neamtzu
- Overview of master planning process
  Carol Mayer-Reed
- Presentation of master plan concepts
  Carol Mayer-Reed
- Discussion of master plan concepts
  Carol Mayer-Reed

Station #1 - Introduction:

- Sign-In / Name Tags / Agendas / Project Schedules
- Comment Cards - fill out or mail in
- Final Thoughts

Station #2 - Project Information:

- Project Introduction
- Project Schedule
- Metro Bond Measure Language
- Project Goals and Objectives
- Questions and Comments

Station #3 - Regional Context:

- Map of Willamette Valley
- Metro Open Spaces, Parks and Trails Regional Target Areas
- Air Photo
- Site Context
- Questions and Comments

Station #4 - Site Features:

- Site Linkages
- Slope Analysis / Sensitive Areas
- Site Opportunities and Constraints
- Questions and Comments

Station #5 - Site Resources:

- Photo Board
- Wildlife Habitat and Vegetation
- Questions and Comments

Station #6 - Master Plan Concepts:

- Concept #1
- Concept #2

Station #7 - "What to name the open space"

END

**City of Wilsonville**
**Wilsonville Tract Master/Management Plan**
**Open House #2**
**October 30, 2002**

## Summary of Input

### Station #1
### Introduction

### Station #2
### Project Information

Preliminary Goals and Objectives

1. Preserve the natural features of the Wilsonville Tract.
   - No additional comments
2. Restore and enhance existing natural resources for ecological diversity.
   - No additional comments
3. Establish site as a regional destination.
   - No additional comments
4. Plan for trail connections to the Wilsonville Tract
   - No additional comments
5. Protect natural areas while providing appropriate passive recreation opportunities such as trails.
   - No additional comments
6. Comply with the Metro Greenspaces Bond Measure regarding appropriate recreation activities on the property.
   - No additional comments
7. Provide the necessary supporting elements for trail usage.
   - No additional comments
8. Provide interpretive information, educational programs and opportunities.
   - No additional comments
9. Provide a pedestrian and bicycle connection through the property from Villebois development to the middle and elementary schools.
   - No additional comments

### Station #2
### Project Information

Questions and Comments:

1. How often do you visit the Wilsonville Tract?
   a. Once a week or more. (1)
   b. Once a month or more. (0)
   c. Once every few months. (1)
   d. Less than twice a year. (0)
2. How often do you anticipate visiting the Wilsonville Tract?
   a. Once a week or more. (1)
   b. Once a month or more. (1)
   c. Once every few months. (0)
   d. Less than twice a year. (0)
3. Why do you visit the Wilsonville Tract? (ex. hiking, biking, walking pets, reading, etc.)
   - Sacred connection to nature.
   - Hiking and pet exercise.
4. Would you bring friends from out of town to the Wilsonville Tract to give them a flavor of the Willamette Valley's native Landscape?
   - I have many times.
   - You bet!

5. What are your top three goals for the Wilsonville Tract?
   - Honor and respect for nature.
   - Keep human impact very secondary, imperceptible would be best.
   - Serene isolation in nature.
6. What is your vision for the Wilsonville Tract?
   - Nature/natural.

**Station #3**

## Regional Context

Questions and Comments:

1. Would you be interested in seeing interpretive information on regional natural history including geology at the site?
   - Only if discreet.
2. Is a linkage to Metro's regional trails important?
   - Depends.
3. Would you like a connection to the Willamette River?
   - That would be way cool!
4. Should this site be a local or regional destination?
   - This should be what it is, not designed to attract.

**Station #4**

## Site Features

Questions and Comments:

1. What would be your preferred mode of transportation to access the Wilsonville Tract?
   - Walking is best for you, best for the Tract and the world for that matter.
2. What type of community events and gatherings do you feel may be appropriate for the site to accommodate from time to time?
   - Nature honoring ceremonies.
3. Do you feel that the current agricultural practices onsite are compatible with public access and use? (Filbert orchard and grass production fields)
   - Filbert orchard needs several rows removed on all sides. Use area for arboretum with speciman conifers, big trees that are too large for home yards like Deodor cedar and weeping willow. Maybe invite agricultural schools to feature newer Oregon cash crops such as wine grapes and new kinds of filberts. Maybe an ornamental grass area.
   - Need to be able to see into property for safety.
   - Marginally.
   - Don't plow agricultural fields in fall! Mud erosion in Legacy Creek is really bad.
   - Orchard is ok, but ryegrass is too much and should be eliminated.
4. What natural resources or site features are important to you?
   - Isolation of the oak tree.
   - The expansive views.
   - The integrity of the whole place as a unity, nature in ascendancy (to dominate).
   - Serenity.
5. What public facilities should be provided on this site?
   - No additional comments.

**Station #5**

## Site Resources

Questions and Comments:

1. Would you be willing to volunteer to help remove

invasive species and restore native plants to this site? If so, please sign below.

- No additional comments.

2. What type of opportunities do you think there are for school aged children to learn about environmental science on the site?
   - No additional comments.
3. Would you be interested in seeing interpretive information regarding natural resources on site?
   - No additional comments.
4. What role does the CREST play in relation to this site?
   - No additional comments.
5. Do you feel that site restoration, stream enhancement/restoration/preservation, and fish & wildlife habitat enhancement are important?
   - No additional comments.

Additional Questions and Comments:

Park naming options:

- Lone Oak Park
- Wilsonville View
- Mill Creek
- Vista View
- Legacy Park
- Bell_____Park (Weather, View, Creek, Aire, Bellburn)
- Oak View Park

## Comments on Scheme #1 Successional Recovery

- Need trail connection to go all the way to river. Hopefully to connect to the Willamette River front Trail (future!)
- Wilsonville Road and Bell Road intersection. Not a good access point. A better access would be at the old water treatment plant. No parking.
- Poop bags for dogs throughout park to encourage a clean park.
- Too many trails in forest.
- I like Option 1. One comment, it would be nice to have an unpaved secondary loop around tract. Extend current one.
- Explore connection for horses from Hunter Creek through old wastewater treatment plant.
- Paths: I hope that the hard surface paths are no more than 6' wide, any larger is unnecessary and has a more adverse impact to the experience!
- Note: Many white oaks propagating naturally in field, now that it isn't plowed/mowed regularly.
- Keep Lone Oak lone. Like oak savannah, particularly around existing oak area around LEC.
- Could/would Villebois side give parking near soft trail access for Villebois residents and visitors?
- Need some parking for access to the north end of Tract!
- Future pedestrian connector: Move trail upslope to stay out of wet, above playground, closer to Charlotte's back yard.
- A trail connecting neighborhoods and schools to the Tract is a must.
- Pedestrian connections to Wood Middle School needs to be pretty direct from Villebois if you want kids to stay on it!
- Parking could go between CREST shed and Boones Ferry School. SAC talked about more parking near school.
- Base rock on trails for the handicap portion would enable pedestrians, equestrians, bikes and handicap to

use them.

- It would be nice to be able to walk dogs on hardscape flat area between filberts, CREST and oak.
- Arboretum in space with filbert orchard now, around parking and out a way toward CREST with picnic areas.
- Do we need this much parking here? Why round?
- Parking for horses, 2 or 3 trailer spaces like Tryon.

**Comments on Scheme #2 Educational Interpretive**

- This trail will be very tricky due to slope issues.
- It is important to me that the view of Mt. Hood is maintained. I like the concept of the oak tree being a focal point, but I would not make it the main feature in this option. Something could happen to that tree.
- Too intense of a focus on the "Lone Oak" Probably do not want all those trails meeting at that one point.
- Have only 2 or 3 trails lead to the oak, so the oak is a more solitary destination and not a busy meeting place.
- CREST Environmental Science Study as part of re-forestation with nursery stock instead of succession.
- Keep some of the open feeling while allowing some of the natural springs and creeks to re-establish themselves.
- Definitely need good paved access for kids, walkways across wetlands.

**Comments on Scheme #3:**

- Don't need this whole loop due to existing sidewalk, just incorporate.
- Concerned about muddy water runoff from winter plowing.
- I like this main trail loop. Lots of joggers use existing perimeter.

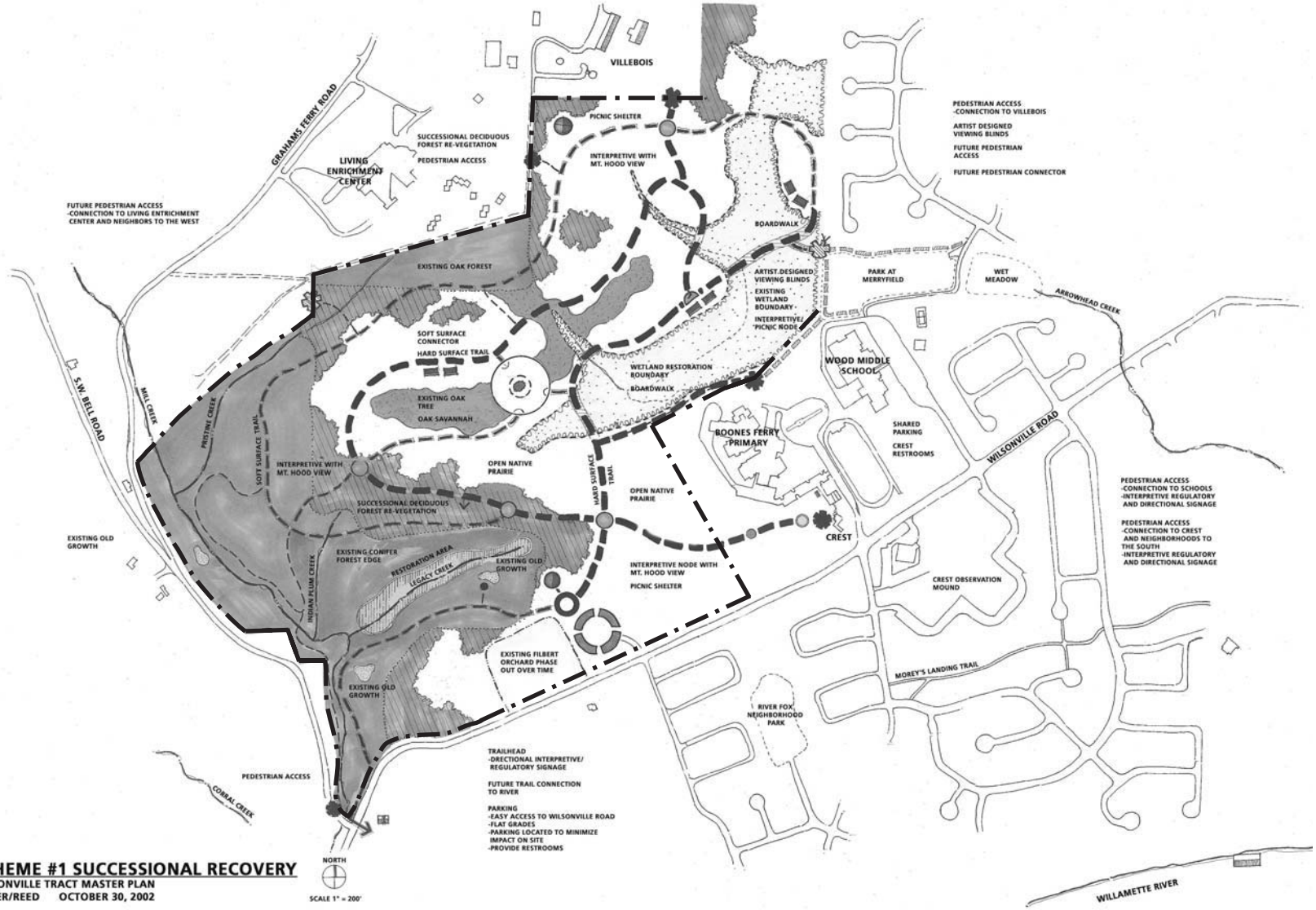
Additional Comments from Comment Cards:

- "Pedestrian access at schools should have bridge/raised trail over wetland. I see kids cutting across this area through the wetland. 10-year olds go through, not around. Scheme #1 looks more favorable. I enjoy interactive plant/tree labeling like what you see at Hoyt Arboretum. I also enjoy sculpture along trails…like Eastbank Esplanade. NO ROADS! I would like to see the orchard stay and not be phased out. Naming: Should have an historical or nature oriented root, rather than a proper name or surname. Leaving an agricultural use, I believe, misses an opportunity to develop a truly unique space for the people of Wilsonville".
- "I like the Alternative #1, "Successional Restoration" concept the best. I think it would give the greatest diversity of vegetation, view and experiences for a visitor. I am skeptical that agricultural use is compatible with the long term "restoration" concept for the site. Too much area in a single culture, too many chemicals affecting the pond and wetlands, and too much conflict with goals of restoring more wetlands. I am sure that horses don't mix well on this relatively small, neighborhood-close site. I have hiked extensively on Forest Service trails. Those used by horses are greatly degraded for pedestrian use. General mix of amenities shown on Alternative #1 is good. Specific locations, numbers of items, etc. need to be discussed before finalizing".

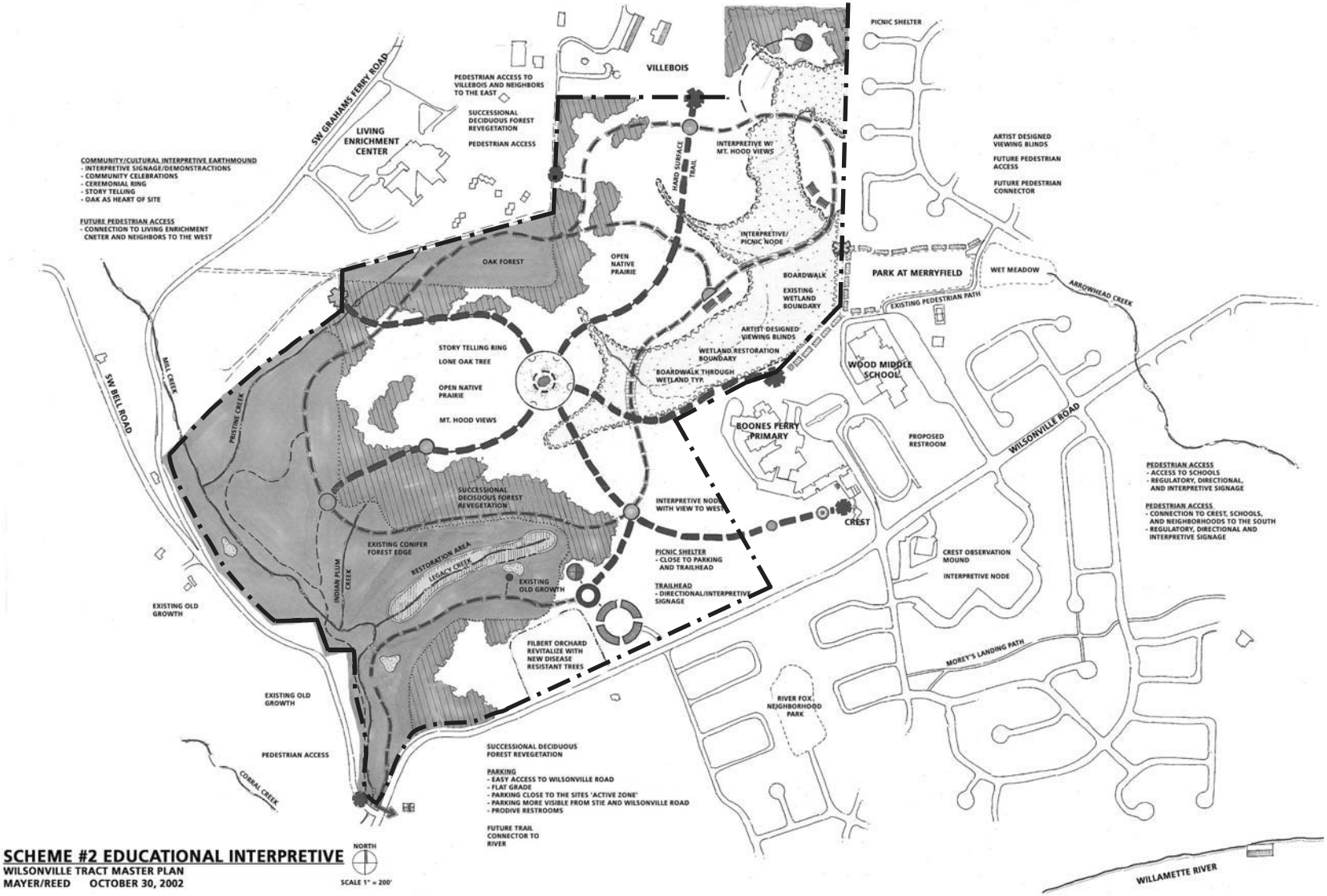
- "Additions to wildlife list: red wing blackbird, turkey buzzard, raccoon, skunk, vole, mole and gopher. Arrange for SMART bus to use a tram or small bus to take children across the park to and from school.

- Incorporate: (1) a wetland interpretive with board walk, (2) wildflowers wherever possible and native plant material, (3) I'm intrigued with the continuity of farming history by using plants that could feed wildlife of the flyway.  Be careful of native wildlife feeding plants that encourage raccoons or over-populations of wildlife in the area, and (4) I  disapprove of opening the tract for equestrian use for many reasons.

END




**SCHEME #1 SUCCESSIONAL RECOVERY**
**WILSONVILLE TRACT MASTER PLAN**
**MAYER/REED OCTOBER 30, 2002**




**SCHEME #2 EDUCATIONAL INTERPRETIVE**
**WILSONVILLE TRACT MASTER PLAN**
**MAYER/REED OCTOBER 30, 2002**

**City of Wilsonville**
**Wilsonville Tract Master Plan**
**Open House #3**
**January 22, 2003**

## Agenda

## Introduction:

- Welcome and introductions
  Chris Neamtzu
- History of the planning process
  Chris Neamtzu
- Presentation of master plan concept
  Carol Mayer-Reed
- Open discussion of master plan concept
  Carol Mayer-Reed

END

**City of Wilsonville**
**Wilsonville Tract Master/Management Plan**
**Open House #3**
**January 22, 2003**

## Summary of Input

### Goals and Objectives

1. Preserve the natural features of the Wilsonville Tract.
2. Restore and enhance existing natural resources for ecological diversity.
3. Establish site as a regional destination.
4. Plan for trail connections to the Wilsonville Tract.
5. Protect natural areas while providing appropriate passive recreation opportunities such as trails.
6. Comply with the Metro Greenspaces Bond Measure regarding appropriate recreation activities on the property.
7. Provide the necessary supporting elements for trail usage.
8. Provide interpretive information, educational programs, and opportunities.
9. Provide a pedestrian and bicycle connection through the property from Villebois development to the middle and elementary schools.

### Concept Master Plan Scheme

Ecological recovery and wildlife habitat enhancement.

- is purpose of the open space

Human use is minimal.

- trail network and facilities to support limited pedestrian use

Existing farming and orchard.

- would be phased out over time
- former watersheds would be restored

Successional forest, oak savannah and wetlands.

- extend into meadow open space
- build on ecotypes and remnant forests that exist on site

Specific areas of restoration.

- will be prioritized, such as Legacy Creek

Pathway system

- connects site to off-site entry points and other trails
- limited use of one primary trail
- two loop trails that provide access internally
- has hierarchy of uses, widths, paving and levels of improvement
- 8-12' wide paved trail and boardwalk for pedestrians and bikes link the schools, CREST, Villebois and a new trailhead located along Wilsonville Road
- in future, trail would cross Wilsonville Road and extend to Willamette River
- paved path serves fire, safety, and maintenance vehicles
- secondary soft-surface trails for human pedestrians only
- portions could be ADA accessible, except where grades become excessive

Picnic shelters and restrooms.

- located on the north and south sides at Wilsonville trailhead and Villebois
- wildlife viewing blinds along the trails, not shown on the plan
- viewpoints and interpretive nodes

Interpretive information

- focus on stories and demonstration of site recovery
- would describe the landscape as an evolutionary and dynamic process
- history of the site would be described to create an understanding of past use, yet build on the values and need for site recovery
- would describe regulations of use relative to dogs, horses and mountain bikes
- interpretive opportunities at the entries along the trail and at nodes

Natural resources plan

- background materials and recommendations for site recovery and maintenance are being developed
- phasing plan will be developed

END

**City of Wilsonville**
**Wilsonville Tract Master Plan**
**Park at Merryfield Neighborhood Association**
**Meeting #1**
**April 3, 2003**

## Minutes

Committee Members Present: Mayor Charlotte Lehan, Jim Morgan, Jane Hart, Deb Scrivens

Park at Merryfield Neighborhood Association Members: Bob and Nancy Cutler, Bill and Joanne Erb, Tammy Faro, Klaus Gibson, Gerry Gregg, John Norman, Ali and Jane Olyaie, Joe Pollen, Michelle Ripple, Tony Rhodes

Clackamas County Sheriff's Office: Deputy Sheriff Mark Koberstein

City of Wilsonville Staff: Kerry Rappold

Consultant: Carol Mayer-Reed

**1.0 Purpose of Meeting**

To discuss the trail alignment adjacent to the east boundary of the Wilsonville property and its proximity to the home owners' property boundaries.

**2.0 Discussion/Agenda Items**

2.1 Welcome and Introductions

Kerry Rappold provided introductory comments and reviewed the evening's agenda.

2.2 Review of Master Plan Process

Jim Morgan spoke about the goals and objectives of Metro's open space acquisition program and how the Wilsonville Tract is one part of a larger regional system of interconnected natural areas, parks, greenways and trails.

Carol Mayer-Reed provided an overview of the master planning process and public involvement conducted from August 2002 to the present. She also reviewed the project goals and described the master plan design components including habitat restoration, trails for wildlife viewing and connections to the surrounding neighborhoods and future Villlebois development and interpretive and educational opportunities.

Deputy Sheriff Mark Koberstein talked about safety and security issues related to trails. Mark discussed his Trail Watch program concept and encouraged the neighbors to form a "Friends of the Wilsonville Tract" group. The group can keep an eye on the trail.

2.3 Questions and Comments:

1. How did you come up with the project goals?

2. How did you choose the people on the Stakeholder Advisory Committee?

People in the neighborhood didn't feel like they were invited to be involved and the public meeting announcements seemed vague and didn't get message across that decisions were being made about the plan. There are members in the audience tonight that would like to be part of that team.

3. Was consideration given to neighbors who abut the Wilsonville tract?

4. Is the trail designed to get kids from school to Villebois? The elementary school is already full, so why make a connection?
   - Carol Mayer-Reed stated that the trail is a regional trail. Even if the Villebois kids don't go to the school, they will use the playing fields after school. One of the goals is to provide non-street connections for kids.
   - There is serious speeding on Camelot St. and it will be much safer to have a trail that children can use instead of the streets.

It is the location of the trail that is the problem, not the fact that there is a trail being proposed. Many of the neighbors agree with the preliminary goals and objectives for the master plan and the natural area focus.

The natural area will increase adjacent property values. The trail will get kids off the streets and reduce potential for accidents. Trail will not be lit to respect the natural habitat and because the ambient light provides enough illumination. Police could patrol the site on motorcycles or mountain bikes.

5. Is the trail a done deal? Once the trail is built, will it be there forever? Can we expect to see a trail in a different configuration/scale/topography?
   - The idea of building a trail through the wetland seems to go against the Goal 5 process that was discussed before City Planning Commission (CPR for streams) earlier this year. Shouldn't there be a 75-100' buffer around wetlands?
   - Carol Mayer-Reed stated that the proposed trail location was conceptual and that the line representing the trail on the master plan illustration was not to scale, nor in its final location. The location would need to be field verified and would need to be located in a way that respected the privacy of the neighbors.

6. Whose property is the drainage tile on near Merryfield Park? Whoever takes responsibility for moving water into the area should fix the problem at Merryfield Park.
   - Mayor Lehan explained that the stormwater issues are a major concern that the master plan will address. Inter-basin transfers need to be addressed in the Wilsonville Tract Master Plan and Villebois Master Plan. One of the subconsultants brings stormwater expertise to the team. Villebois has been cooperative in looking at the problems in Legacy Creek.

What you are hearing from the neighbors is not fear of the trail, but the request that a common sense approach be used in siting the trail.

7. What distance is comfortable between the trail and the houses?

8. How wide would the trail be?
   - Carol Mayer-Reed explained that the proposed trail would be 10 to 12 feet wide.

Living Enrichment Center is very amenable to having their extensive trail system tie in with the site's trail system.

9. What is a viewing platform?
   - Carol Mayer-Reed explained the need to design

the wetlands and then put the viewing blind in after the fact.

10. If you have to move land to build the trail, there will be erosion. Wouldn't it be better to move the location of the trail? Kids will take the shortest path. Need lighting and handrails.
    - Deputy Sheriff Mark Koberstein explained that you can't have lighting, if you are trying to preserve the wildlife. After dark, it is best to walk on the streets.

11. If the trail is supposed to attract people from the region, wouldn't you want to have it near the houses?
    - Deputy Sheriff Mark Koberstein explained that if someone wants to go in your backyard and creep around, they are going to do that. The trail eliminates the cover that thieves need to creep and peep. Trail will actually discourage thieves. They like places they can hide. Trails closer to homes can actually be safer than trails that are out in the middle of a site with no view by neighbors.

    It is a good idea to walk the proposed trail with the neighbors and talk about their concerns while looking at the lay of the land. Can talk about vegetative buffers between properties.

    Need to establish boundary between the park and homes. People can control their access to the trail with gates.

    Should really consider not allowing dogs in the natural area, defeats the purpose of preserving it for wildlife.

12. What about having a pen for off-leash dogs to run?
    - Kerry Rappold informed the participants that there is a fenced in pen for dogs at Memorial Park.
    - Jim Morgan explained that the Bond Measure intended for the acquisition of these lands to be for natural area protection. Metro does not allow dogs in their natural areas as they conflict with the wildlife.
    - Jane Hart added that dog waste can negatively impact water quality.

13. Can there be mile markers?

2.4 Conclusion - A group of neighbors will walk the approximate trail alignment with members of the project team.

END

# Appendix D

Permitting

## Permitting

The permitting process is triggered by an application for construction or improvements to sites that are within the floodplain or floodway, contain wetlands, or impact other water quality-related natural resources. Permitting of development will follow typical local, regional, state and federal requirements. Because Mill Creek has been determined to contain endangered fish species and wetlands have been preliminarily identified on the site, natural resource agencies will be reviewing all plans for many of the site improvements noted in this report.

### Grading Permit

Any type of development or construction that requires changing the existing topography by the movement of more than 50 cubic yards of soil requires a Grading Permit issued by Clackamas County. This would include, but is not limited to: parking lots, building foundations, bicycle trails and some types of pedestrian trails. Any proposed development would be reviewed for required permitting prior to submission for development approval.

### NPDES Permit

National Pollutant Discharge Elimination System (1200-C) NPDES Permit is required relative to the grading permit and has requirements for erosion control techniques, which prevent or reduce impacts of soil erosion.

### Stormwater Permit

Local jurisdictions require a stormwater run-off control plan and devices that control, reduce and mitigate potential increases to stormwater run-off directed to local utilities and natural streams, rivers and other bodies of water. Collection devices such as stormwater detention ponds, wet ponds, and bio-swales may be required prior to development, depending upon the assessed impacts.

### Sanitary Sewer Connection Permit

A Sanitary Sewer Connection Permit issued by Clackamas County will be required for any toilet facilities. Deep pit toilets proposed in areas with accessible points of connection to municipal sewer services would probably be denied due to groundwater contamination issues.

### Water Environment Services

Clackamas County Water Environment Services (WES) oversees Metro Regional Government, Title 3 areas. These are areas within the floodplain, adjacent to delineated wetlands and other water quality resources that fall under the Title 3 definition.

### Clean Water Act - Section 404

Clean Water Act - Section 404 is administered by the Army Corps of Engineers and is required for dredge and filling permits within floodplain areas and river areas. This also includes wetlands.

### Environmental Protection Agency (EPA)

Environmental Protection Agency implements most of the Clean Water Act including Section 303 (Water Quality Standards). Oregon State Department of Environmental Quality (ODEQ) administers applicable regulations.

### Oregon Division of State Lands (ODSL)

Oregon Division of State Lands has review jurisdiction over all projects that require cut or fill within a protected watershed, flood plain, floodway, wetlands or waters of the state.

### Oregon Department of Fish and Wildlife (ODFW)

Oregon Department of Fish and Wildlife has review jurisdiction over any type of development that is proposed within 25 feet of any waterway. ODFW reviews all plans and makes comments to ODSL. ODFW does not have approval authority.

## NOAA

The National Oceanic and Atmospheric Administration implements the Endangered Species Act (ESA) and reviews plans relative to ESA impacts on non-anadromous fish, wildlife and plants.

## National Marine and Fisheries Service (NMFS)

The National Marine and Fisheries Service implements the ESA and reviews all projects that may impact any endangered anadromous fish.

# Appendix E

Trail Types & Construction Details

## TRAIL TYPES

A hierarchy of four trail types based on width and surface conditions are listed below:

Paved Trail

- Universal access based on the American with Disabilities Act (ADA) guidelines.
- Pedestrian and bicycle usage.
- Eastern edge of the inner loop of the site.
- Constructed of asphalt and 9 feet wide.

Gravel Trail

- ADA accessible.
- Pedestrian usage.
- Western edge of the inner loop of the site.
- Constructed of firm and stable crushed gravel 6 to 9 feet wide.

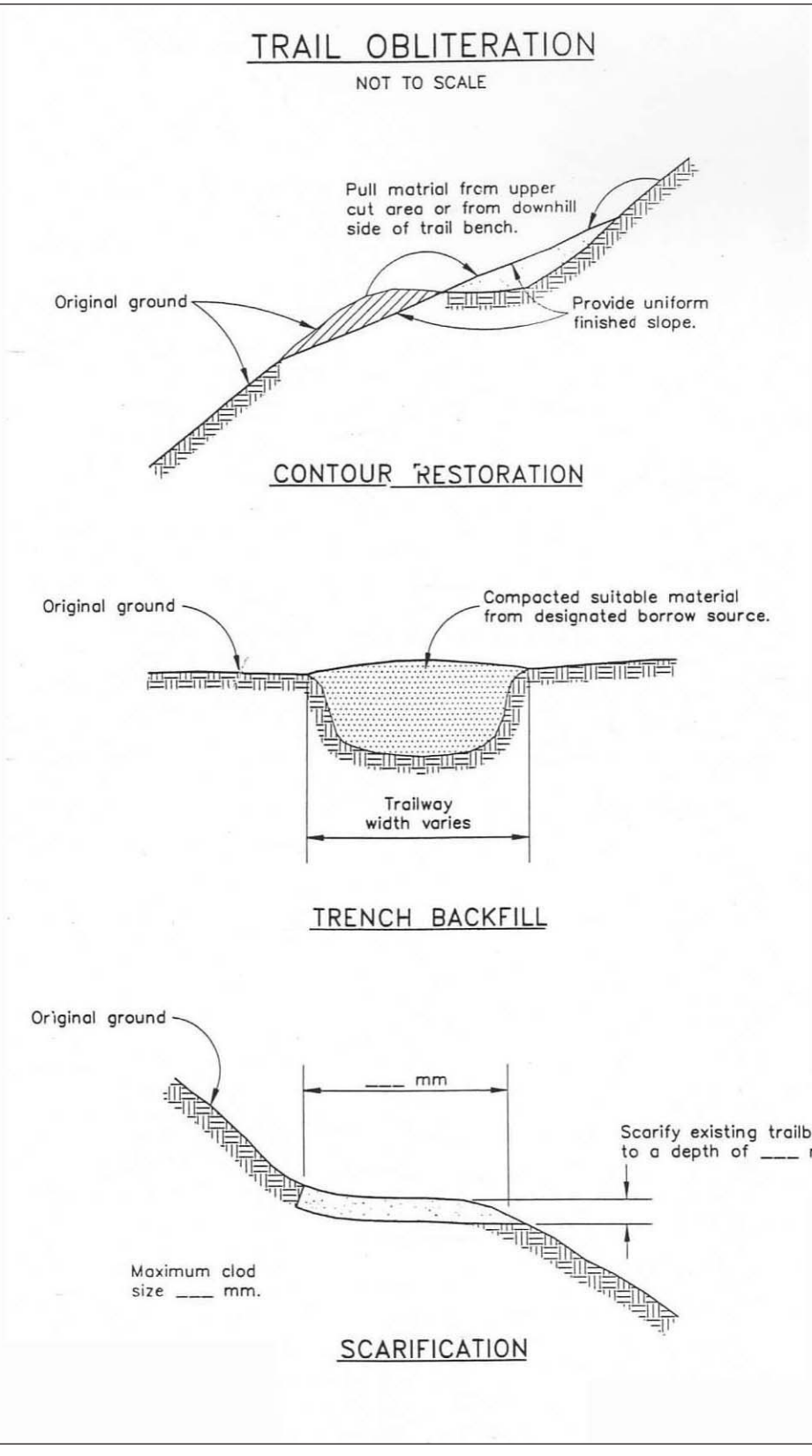
Soft Surface Trail

- Pedestrian usage.
- Forest walk with side trail to a stand of old growth.
- Connects with the inner loop/interpretive node on the west side of the site.
- Connects with the south trailhead off Wilsonville Road.
- Constructed of forest duff or wood chips, 3 to 4 feet wide.

Soft Surface Footpath

- Pedestrian usage.
- Forest walk along Mill Creek crossing just west of Indian Plum Creek.
- A series of switchbacks through the forest.
- Connects to the soft surface trail.
- Constructed of duff and tamped soil, 2 to 3 feet wide.

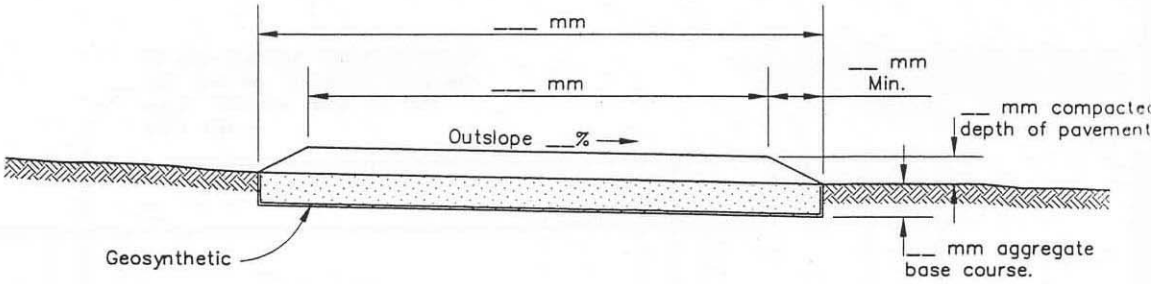
The following U.S.D.A. Forest Service details are included to provide information about the intent of the trail design for the Wilsonville Tract.



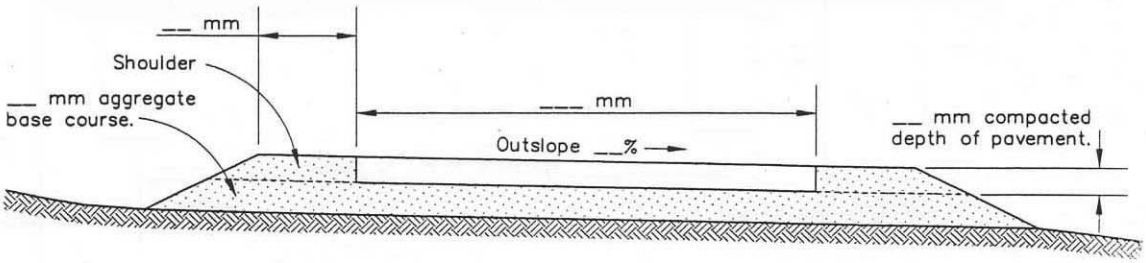

## Trail Obliteration

# BITUMINOUS SURFACING

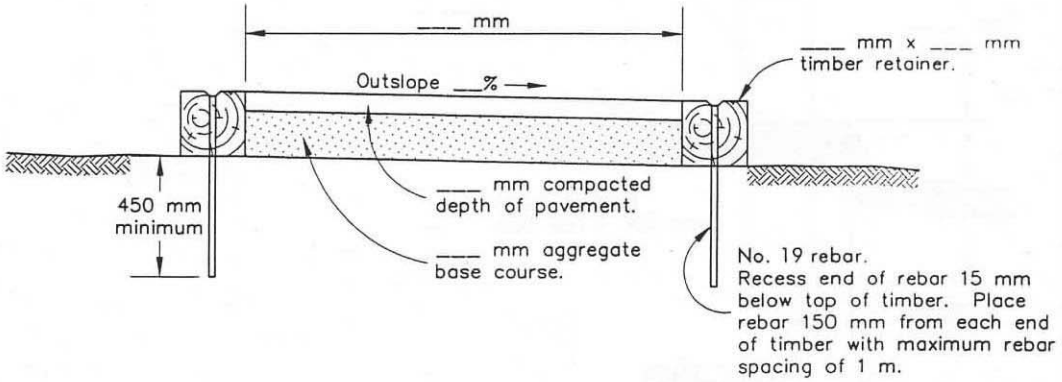
NOT TO SCALE




## BITUMINOUS SURFACING – NO SHOULDERS




## BITUMINOUS SURFACING WITH SHOULDERS




## BITUMINOUS SURFACING WITH RETAINERS

RETAINER NOTES:

| LOCATION | MATERIAL | SPECIES | SIZE (mm) | TYPE OF TREATMENT | MINIMUM RETENTION kg/m3 |
|---|---|---|---|---|---|
| | | | | | |
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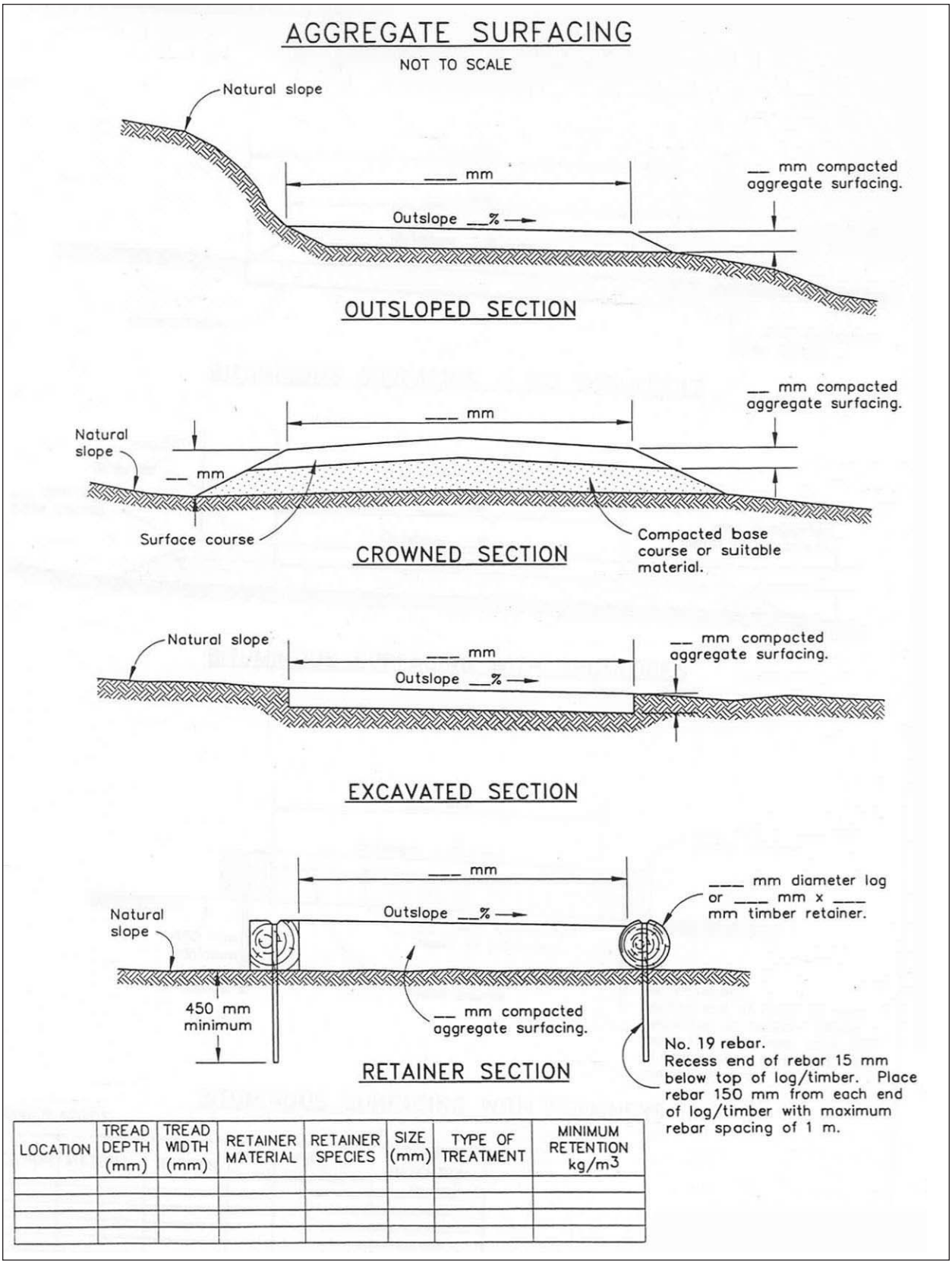


| LOCATION | TREAD DEPTH (mm) | TREAD WIDTH (mm) | RETAINER MATERIAL | RETAINER SPECIES | SIZE (mm) | TYPE OF TREATMENT | MINIMUM RETENTION kg/m3 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
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## Aggregate Surfacing

# CLEARING LIMITS

NOT TO SCALE

## Clearing Limits (mm)

| Location | Uphill | Downhill | Height |
|---|---|---|---|
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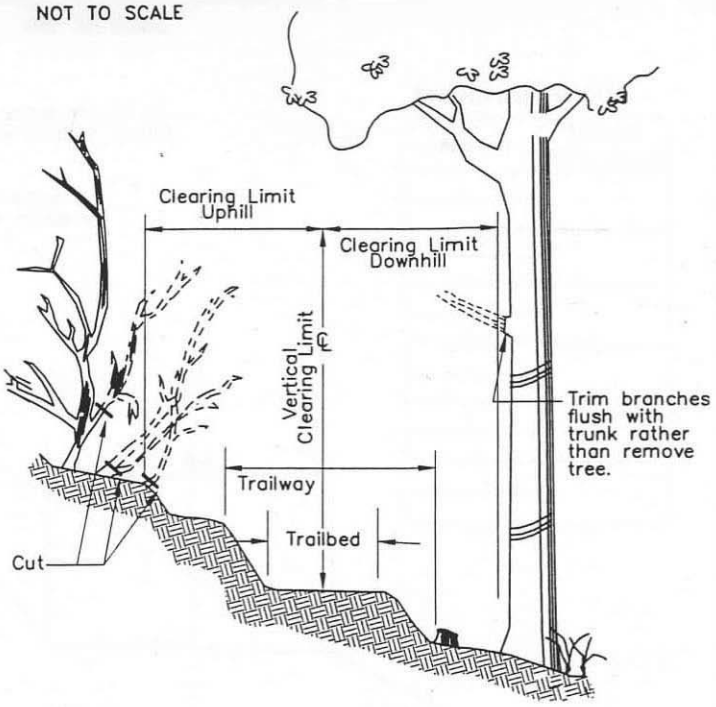
Do not remove trees over ___ mm diameter if they are over _____ m from the centerline (both sides).

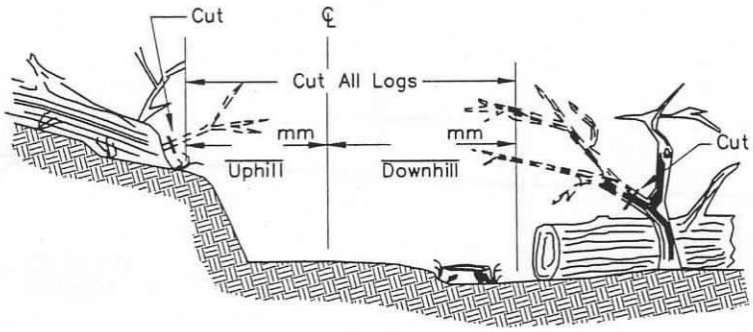
Remove all trees _____ mm or less in diameter if they are within _____ m of centerline (both sides).



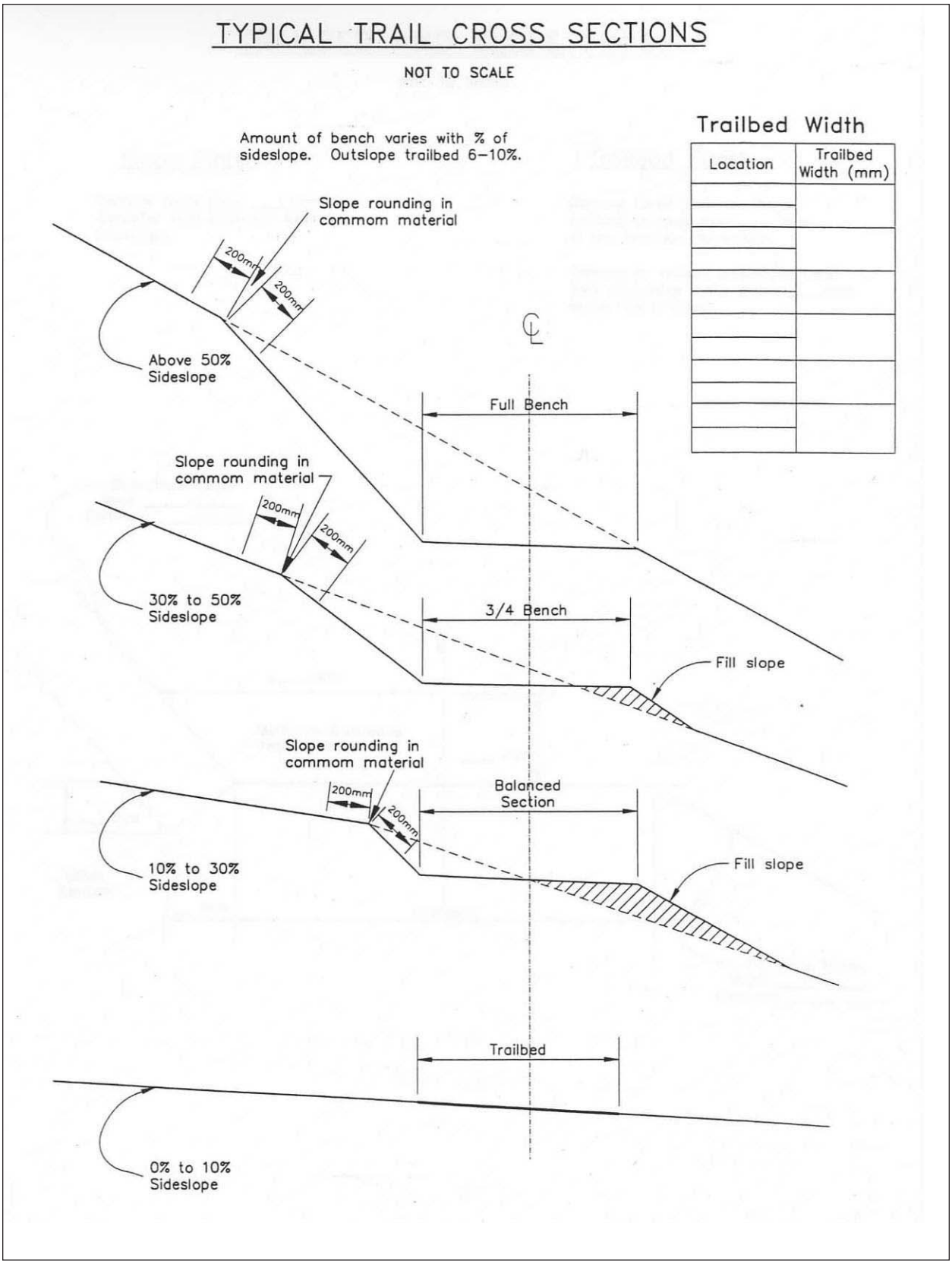

## Stump Height Requirements* (mm)

| Stump Position | Side Slope | Uphill | Downhill |
|---|---|---|---|
| Stumps between the trailway and clearing limits. | Side slope less than or=to 10% | | |
| | Side slope over 10% | | |
| Stumps outside the clearing limits | Side slope less than or=to 10% | | |
| | Side slope over 10% | | |

*All heights measured on uphill side of stumps.




## Clearing Limits




## Typical Trail Cross Section

# TRAILBED AND SLOPE FINISH

NOT TO SCALE

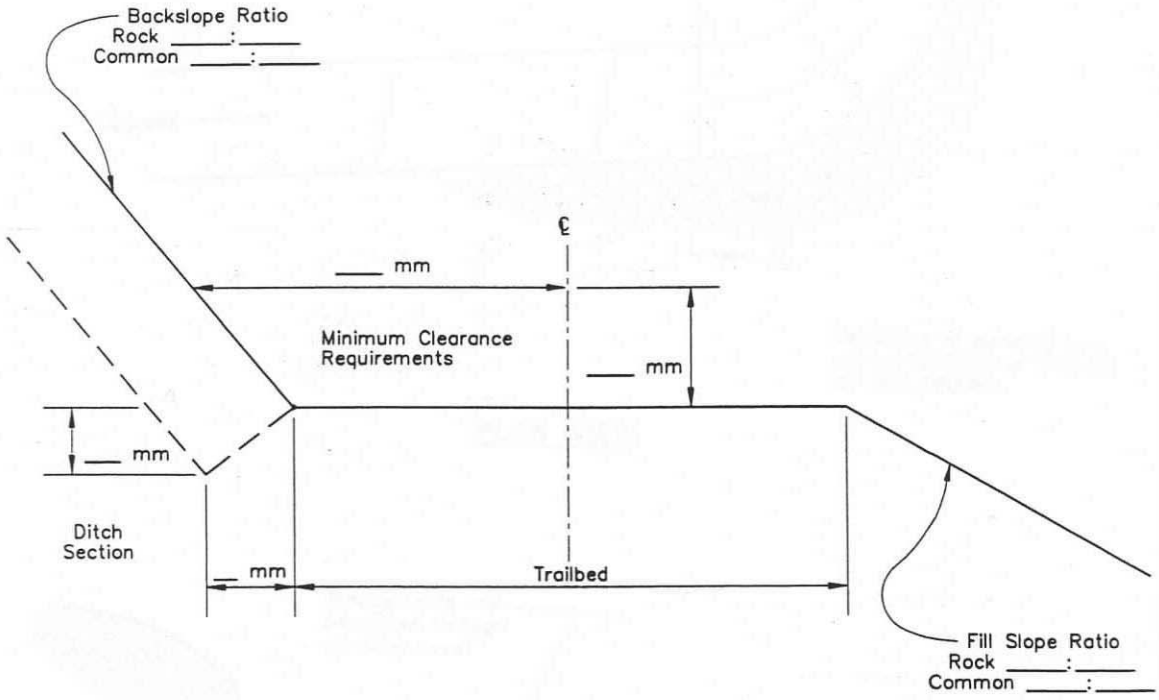
## Slope Finish

Remove roots over ____ mm in diameter that protrude from the backslope.

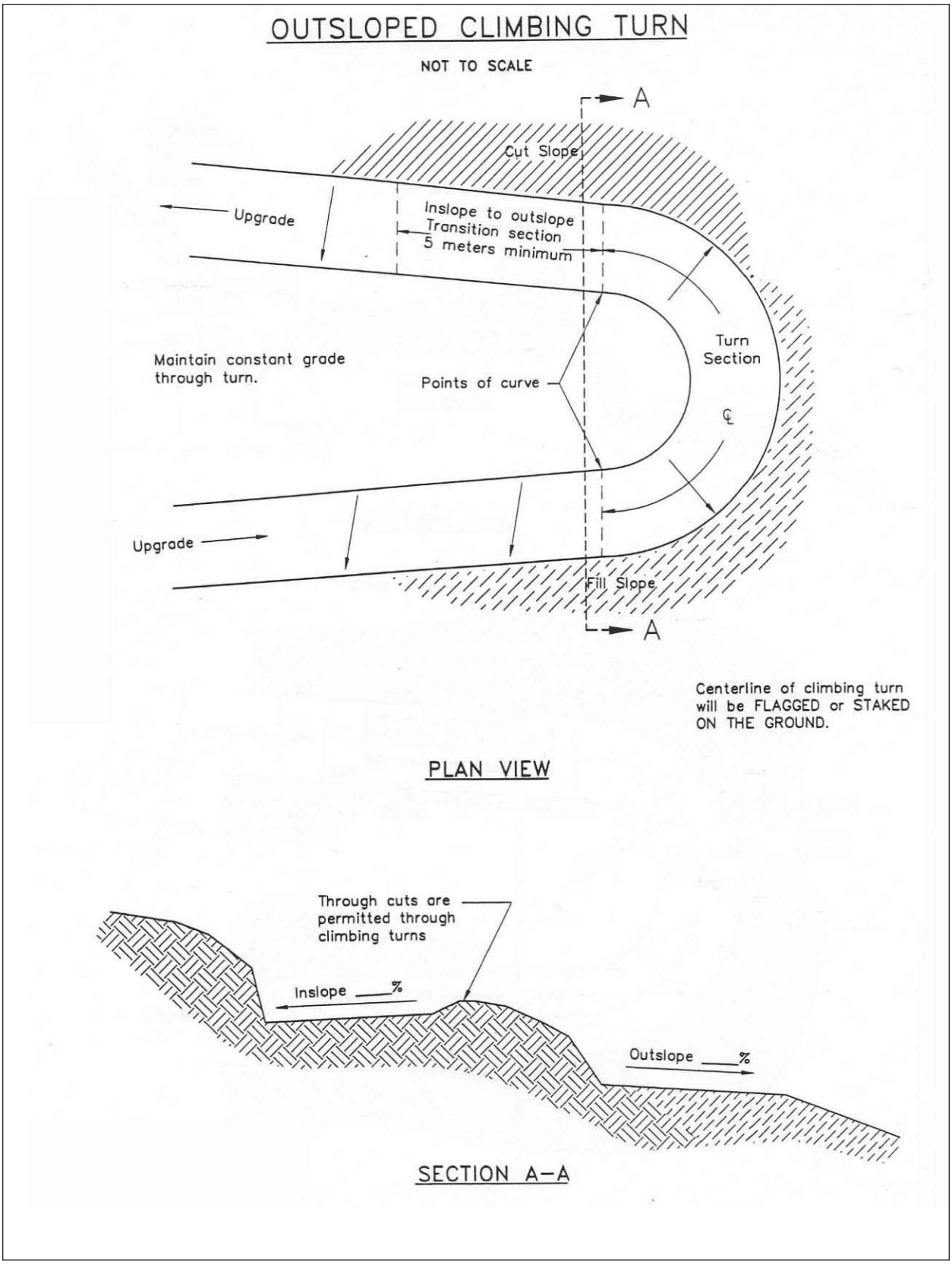
## Trailbed Finish

Remove loose rock on the trailbed surface over ____ mm in the smallest dimension.

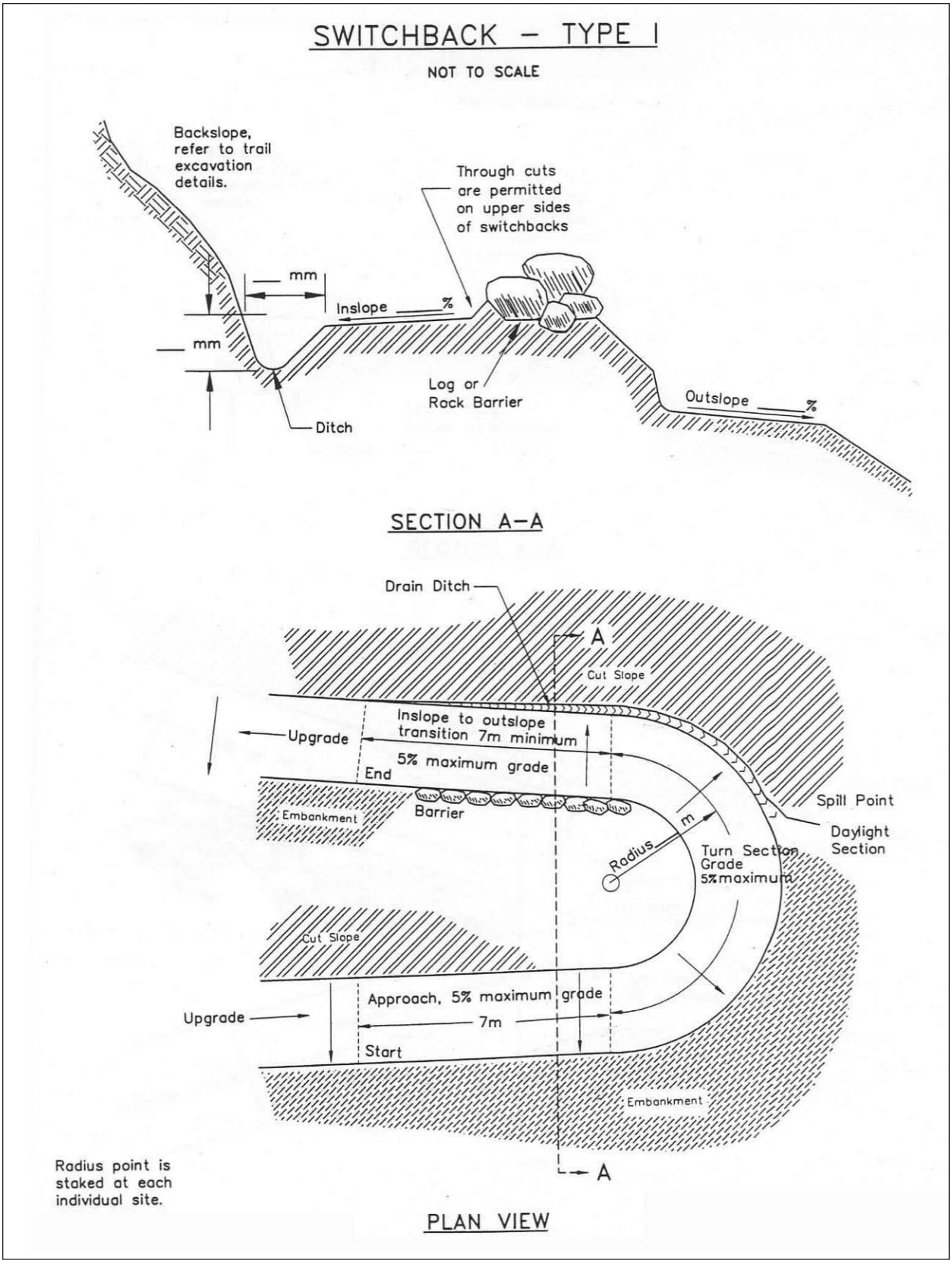
Remove or reduce embedded rock that protrudes more than ____ mm above the trailbed.



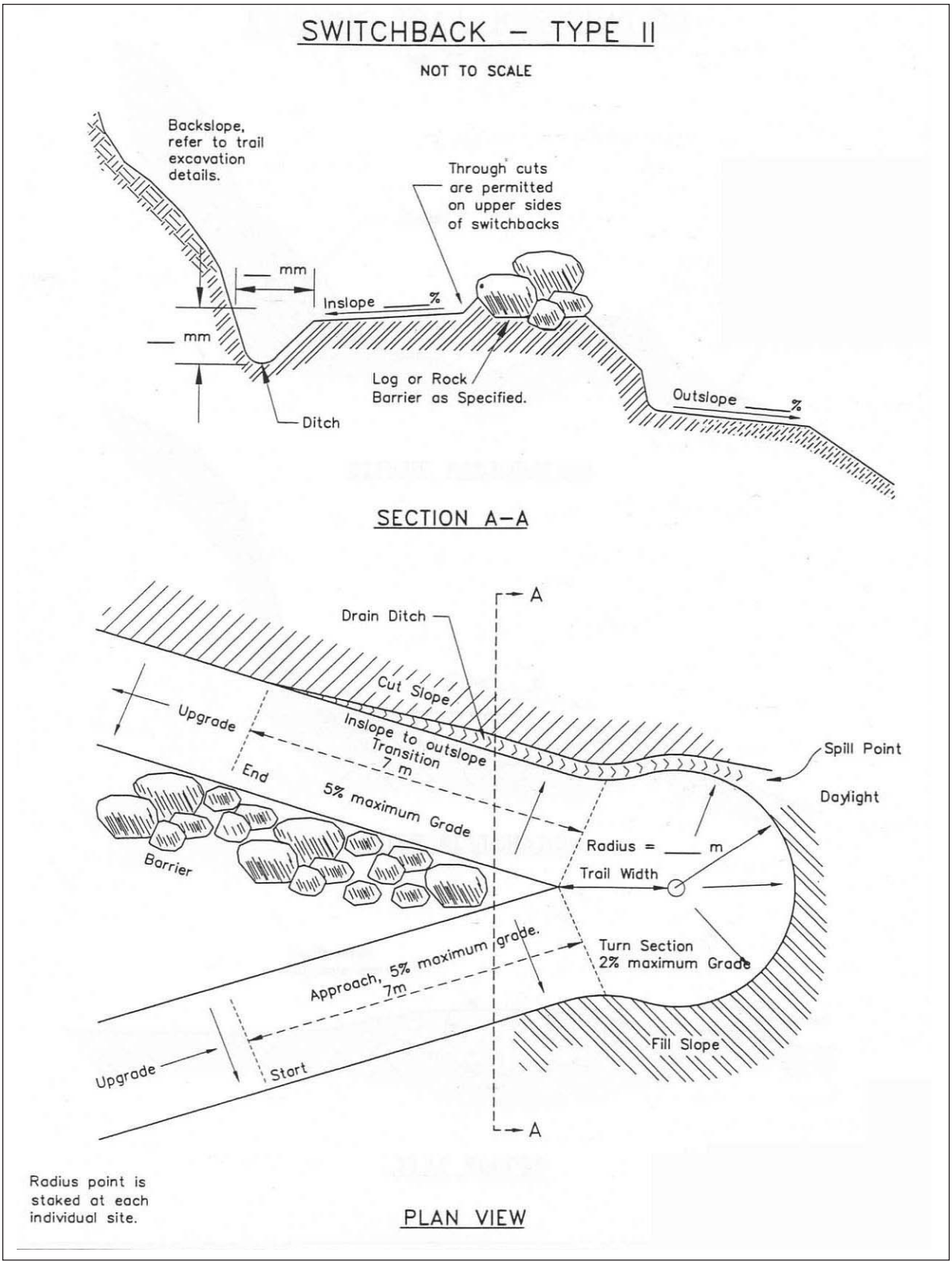

**Trailbed and Slope Finish**




## Outsloped Climbing Turn



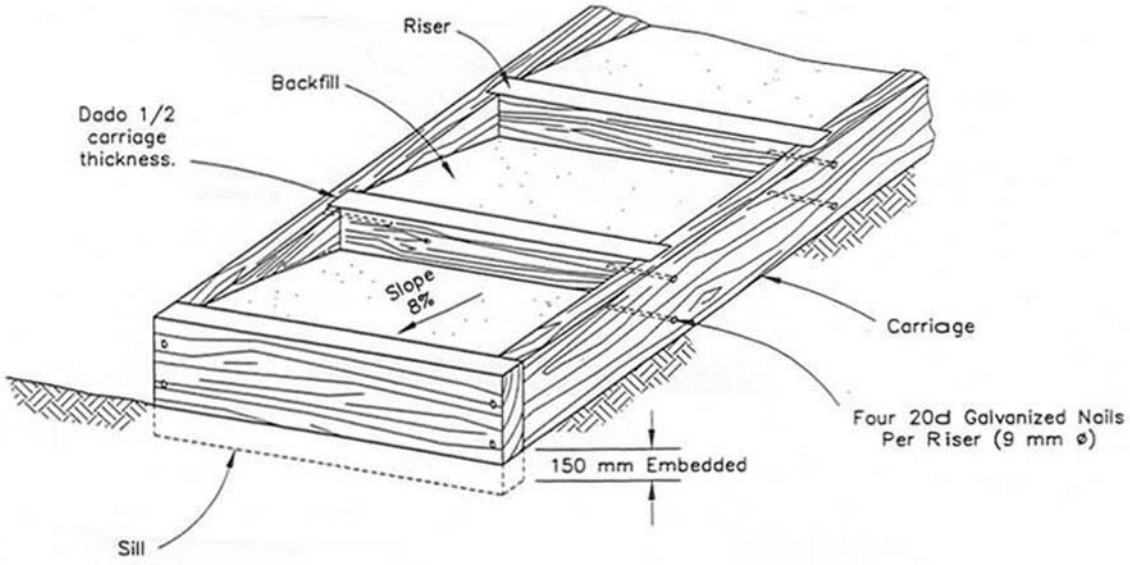

## Switchback Type 1




## Switchback Type II

# CRIB LADDER STAIRWAY

NOT TO SCALE




Preservative Treatment:

_____

Net Retention _____ kg/m$^3$

## STAIRWAY DIMENSIONS

| Location | Step Rise | Step Run | Width | Carriage Length | Carriage/ Plank Step Dimensions | Sill Dimensions | Species |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
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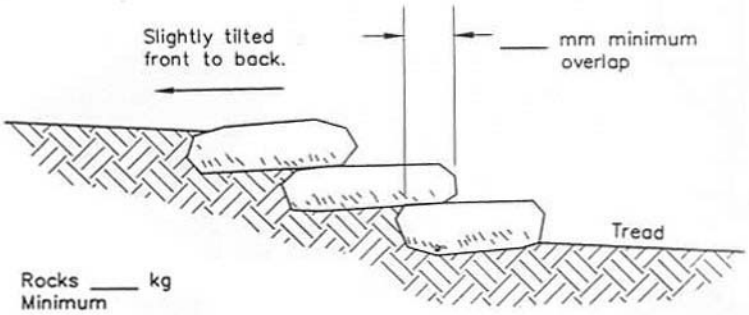
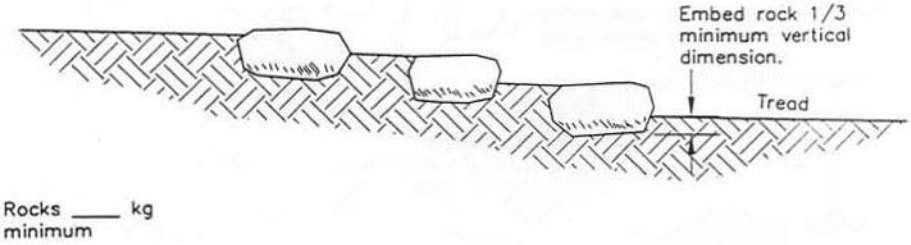
**Crib Ladder Stairway**

# ROCK STAIRWAYS

NOT TO SCALE




## OVERLAPPING ROCK STAIRWAY




## ROCK RISER STAIRWAY

| Location | Type | Maximum Step Rise | Maximum Step Run | Width |
|---|---|---|---|---|
| | | | | |
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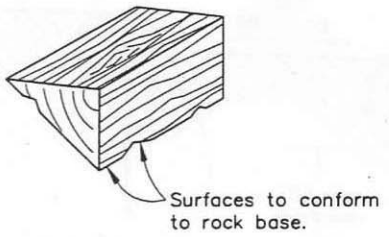
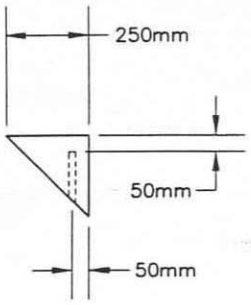
# PINNED STAIRWAY

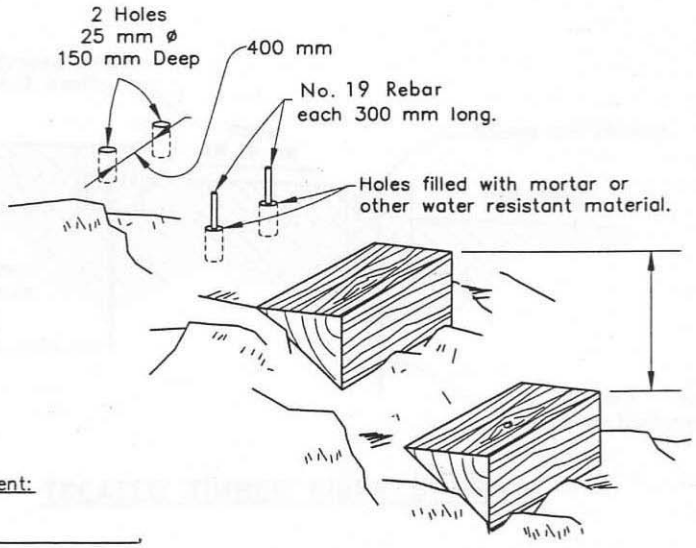
NOT TO SCALE




STEP




TYPICAL END VIEW
OF TREADS




Preservative Treatment:

_____,

Net Retention _____ kg/m$^3$

Shape treads and place over rebar to provide a firm, solid contact with the rock. Tilt tread front to back 2%.

| Location | Step Rise | Step Run | Width | Species |
|---|---|---|---|---|
| | | | | |
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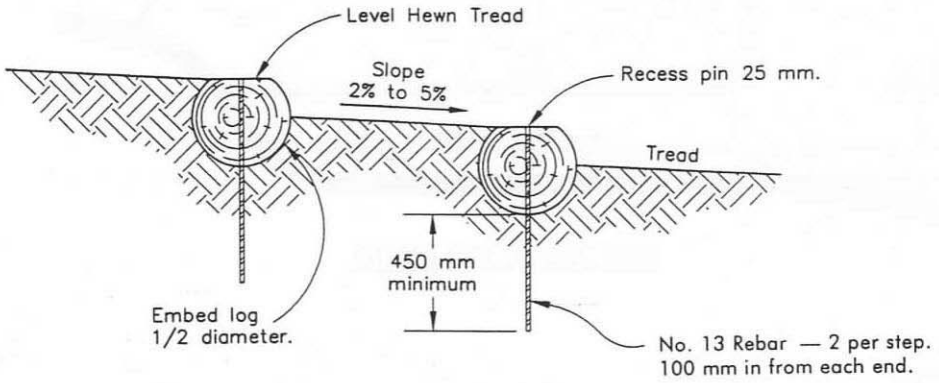
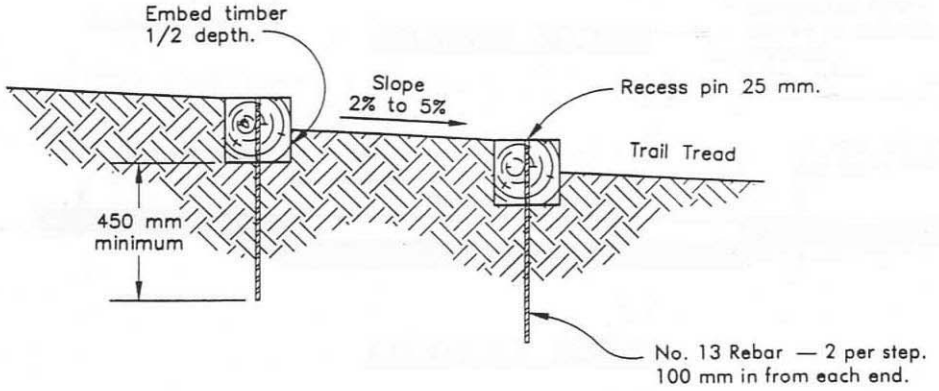
## Pinned Stairway

# LOG AND TREATED TIMBER RISER STAIRWAY

NOT TO SCALE




## LOG RISER STAIRWAY




## TREATED TIMBER RISER STAIRWAY

Preservative Treatment:

_____

Net Retention _____ kg/m$^3$

| Location | Step Rise | Step Run | Step Width | Riser Material Type | Riser Material Dimensions | Species |
|---|---|---|---|---|---|---|
| | | | | | | |
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**Log and Treated Timber Riser Stairway**

# Appendix F

Preliminary Estimate of Implementation Cost

# Estimated Capital Improvements Costs for Wilsonville Tract

## Inventory Assessment & Ecological Monitoring

| Description | Unit | Quantity | Cost Range | Implementation |
|---|---|---|---|---|
| Establish wetland delineations | LS | 1 | $7,500 - $9,500 | Phase 1 |
| Identify planting buffer needs along east boundary | LS | 1 | $5,000 - $7,000 | Phase 1 |
| Implement buffer planting (approximately 23 acres) | yearly | 1 | $20,000 - $25,000 | Phase 1 |
| Research USDA Natural Resources Conservations Service records for documentation of agricultural drain tile system | LS | 1 | $2,000 - $3,500 | Phase 1 |
| Assess and begin ecological restoration and enhancement of oak savanna and native open prairies | yearly | 1 | $5,000 - $20,000 | Phase 2 |
| Mill Creek - Restoration and enhancements Passive approach | LS | 1 | $150,000 - $300,000 | Phase 1 & 2 |
| Mill Creek - Restoration and enhancements Active restoration | LS | 1 | $300,000 - $450,000 | Phase 1 & 2 |
| Legacy Creek - Remove out of basin equipment for transfer of stormwater, arrest head cuts & rehabilitate bank failures | LS | 1 | $250,000 - $500,000 | Phase 1 & 2 |
| Legacy Creek - Restore onsite drainage patterns | LS | 1 | $200,000 - $300,000 | Phase 1 & 2 |
| Indian Plum Creek - Restore stream channels | LS | 1 | $250,000 - $350,000 | Phase 1 & 2 |
| Pristine Creek - Restore headwaters | LS | 1 | $250,000 - $350,000 | Phase 1 & 2 |
| Yearly monitoring of site | LS | 1 | $3,000 - $5,000 | Phase 1, 2 & 3 |
| Vegetative Management (invasive species control, plant maintenance/care and contract administration) | LS | 1 | $14,500 - $108,000 | Phase 1, 2 & 3 |

# Estimated Capital Improvements Costs

## Design

| Description | Unit | Quantity | Cost Range | Implementation |
|---|---|---|---|---|
| Prepare topographic and existing features survey for entire site. | LS | 1 | $20,000 - $50,000 | Phase 2 |
| Prepare Design Documentation for entire site. | LS | 1 | $80,000 - $140,000 | Phase 2 |
| Construction Administration & Permits | LS | 1 | 10 - 15% of construction costs | Phase 3 |

## Construction/Furnishings

| Description | Unit | Quantity | Cost Range | Implementation |
|---|---|---|---|---|
| Rough grading | s.f. | 30000 | $7,500 - $10,000 | Phase 3 |
| Fine grading | s.f. | 30000 | $4,000 - $6,000 | Phase 3 |
| Asphalt parking lot per stall (includes paving, curb, striping & drainage) | each | 20 | $30,000 - $40,000 | Phase 3 |
| Access points - schools, park, Villebois, LEC | LS | 1 | $8,000 - $12,000 | Phase 3 |
| North/south paved trail (includes grading, base rock & paving) | s.f. | 37800 | $110,000 - $150,000 | Phase 3 |
| CREST Connector Trail (includes gravel, grading and header board) | s.f. | 6400 | $13,000 - $17,500 | Phase 3 |
| Boardwalks | l.f. | 1800 | $135,000 - $270,000 | Phase 3 |
| Gravel trail (includes grading and header board) | s.f. | 43200 | $80,000 - $120,000 | Phase 3 |
| Soft surface trail | s.f. | 12500 | $15,000 - $20,000 | Phase 3 |

# Estimated Capital Improvements Costs

## Construction/Furnishings

| Description | | | | |
|---|---|---|---|---|
| Restroom approximately 600 s.f. | each | 1 | $80,000 - $100,000 | Phase 3 |
| Restroom (CREST) approximately 600 s.f. | each | 1 | $80,000 - $100,000 | Phase 3 |
| North and south picnic shelters | each | 2 | $20,000 - $40,000 | Phase 3 |
| Viewing blinds | LS | 1 | $10,000 - $20,000 | Phase 3 |
| Site furnishings - Picnic tables, trash receptacles, bicycle racks & drinking fountains | LS | 1 | $20,000 - $50,000 | Phase 3 |
| Interpretive signs | LS | 1 | $20,000 - $50,000 | Phase 3 |

## Totals

| Description | Cost Range |
|---|---|
| PHASE 1 | $1,447,500 - $2,408,000 |
| PHASE 2 | $1,522,500 - $2,573,000 |
| PHASE 3 | $687,750 - $1,141,325 |

General Assumptions:

1. Cost estimates apply only to improvements within the property.
2. Wilsonville Tract property is approximately 230 acres/10,018,800 s.f.
3. All costs are estimated in 2003 prices and are subject to 3 - 5% yearly increases.
4. Costs can vary based on phasing of work.
5. Costs include burning the total 135 acres of oak savanna/prairie yearly. This cost could be reduced by burning a rotation of 27 acres a year over 5 years then beginning the burn cycle again.
6. Yearly costs will change after the final implementation is completed. Vegetation management costs will decline over time as plants become established.